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The UNITED STATES INFANTRY ASSOCIATION WASHINGTON, D. C.

OCTOBER, 1917

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VOL. XIV OCTOBER, 1917 No. 4

Training in Morale

By Captain Allan L. Briggs, 3d Infantry

HAVING been during March and April on the English and French fronts, and having spent most of my time in the schools of both armies, a general aspect of their instructional work may be of interest. The standard of instruction in the allied armies is set by the axiom, "Ignorance is death." As Colonel Robinson, D. S. O., of the General Staff, said to me in his quiet, pleasant voice, "It is simply this—if you don't know, you get killed." This truth is not only recognized by the generals and their staffs, but by all commanders and men down to the new drafts just arrived in France.

Last April, at a base school, ——, I saw some of the men just arrived being trained. There was an intensity, an eagerness in their work equal to anything we see here in a soldier's ball game. An officer at the school told me: "We can't give it to them fast enough."

Presumably, nothing but actual losses and the stories of the wounded will wake our soldiers up to the necessity for their top-notch endeavor if they would win out to come home and tell about the war. In the training camps abroad, in no drill or exercise is there permitted a listless attitude or movement. To get that fifth of a second that means life or death in the war over there, a fifth of a second faster than the enemy, is the main purpose of all drills and exercises. "Cut the time, carry on," is heard on all sides, and the response is immediate. An illustration of this is the simple drill movement of "right dress" as executed at the schools. At the command, the right guide stands fast, the other men step smartly one pace to the front with a crack of the heels, and then, having seen the prolongation of the line, they quickly dress back to their proper places. Very little correction is necessary. Giving way to the left was executed by short, rapid steps that gave a sense of smartness to an usually most tiresome performance. This element of smartness and team smoothness is searched for and found in all drills. Any blunder or slow movement by a man is promised speedy death when he goes "over the top," and the sweating soldiers under instruction can hear the rumble, day and night, of artillery. This atmosphere of battle and the front we cannot have in the United States, but as soon as our officers, the trainers of our men, realize the supreme importance of speeding up the drill and work

they will be able to get the proper "pep" into the men. But the example must first be shown by the officers.

In bayonet fighting, in trench-mortar work, in bombing, in machine-rifle and machine-gun work the jump can only be had on the German, who is mostly a veteran, by utilizing that quality athletes call "spring," and which the American has in a greater degree than any other man. We want evidence of that spring in every drill; short drills, but as fast and smooth as possible. Raggedness must, of course, be guarded against.

Another standard fixed by the intensity of the war is, "Having reached an objective, never retire." Stay until you are washed out. At the beginning of the war if a command, a battalion, company, or platoon found itself cut off or outflanked, the commanding officer faced the problem, "Would it be better for me to retire and save my command, or hold out and wait for supports?" That dilemma no longer obtains—*you stay*. The moral advantage of this decision is that indecision is eliminated and all thought is concentrated on fighting with desperate resistance, no matter how hopeless your situation may be. The tactical advantage lies in the fact that a very small detachment of stout-hearted infantry, armed with the rifle, machine rifle, rifle grenade, and hand grenade, can so punish an attacking force at close quarters that often it can check an attack until supports come up. This has actually occurred. Had the detachment retired and the line been occupied by the enemy, the retaking of the position would have necessitated the employment of artillery and the loss of many more men than the original detachment in question. Furthermore, the men launched in the first waves are considered tactically expended after they have gained their objective. Their safety has no tactical value in the plan of attack. Nothing further is expected of them. Their safety and further use are not counted upon. Other waves are to furnish the decisive factor.

Another phase of modern warfare in France will demonstrate the need of the highest standard of excellence in moral training. From the time a command goes up to take its turn in the front line until its return to billets, the unauthorized absence of any man from the trenches is punished as desertion. The men are made to understand the conditions, and the first man who unlawfully absents himself pays the penalty. British officers insist that, if the least leniency is shown, this evil practice will grow to an alarming extent and then it is very difficult to check. Firm steps must be taken at the first indication of the trouble, and they are taken.

The instruction in grenades and trench mortars is done with live ammunition. To be sure it is dangerous work and accidents occur, but to be ignorant or slow is more dangerous.

The British and French officers state that all the old things they have learned were good. Discipline and all the things that go to make discipline—set up, snappy drill, neatness in dress, saluting; in fact, they are more necessary than ever. The strain of this war, greater than that of all previous wars, has eliminated most of the dark-skinned races. Only the soul of the white man, upheld by discipline, tradition, love of country, the determination to win, is able to stand the ordeal.

The colonial troops now also recognize the value of the old standards of discipline. The scheme upon which the

training of British troops in France is based is as follows.

BASE SCHOOLS AND ARMY SCHOOLS

There are five base schools, each accommodating about 10,000 men. These schools receive the new drafts from England, test them as to their efficiency and impart instructions in the five essential subjects for front line troops: musketry, grenade work, bayonet work, gas and trench relief, and occupation by day and night. Besides these essentials, if time permits, instruction is given in drill, physical exercise, skirmishing, rapid wiring, rapid laying out of trenches, judging distance and fire control, patrolling, digging in with intrenching tool, occupation and consolidation of craters, intrenching, resetting drainage, etc. The course is for nine days of five hours a day. Bombing with live bombs is left for a subsequent course. Nine days may seem a very short time, but it is to be remembered that the course is principally a test for efficiency. The incompetents and slow-witted are weeded out and divided into three classes: (1) Men who are most backward; (2) men who are more advanced than No. 1, but not fit to pass out; (3) men preparing for passing out.

ARMY SCHOOLS

In each army—and there are five armies—there is a central parent school and a group of schools which teach the specialties. The students are captains and lieutenants and noncommissioned officers who are trained to become the instructors at divisional schools and also to train their own men. Other objects are to bring officers and noncommissioned officers of various regiments together to exchange ideas, to get out of the "trench groove" and open their minds to other lines of thought by teaching open warfare, to insure uniformity of doctrine and encourage *esprit de l'armée*, to give students a rest from trench life, to foster a strict sense of discipline, and lastly to help the students realize by lecture the gigantic task that is to be accomplished and that it can only be mastered by everyone doing his utmost.

The dominating idea, the compelling ideal that will save a man in his hour of trial, must be given him by his company commander. The soldier must have a leader for his soul as well as his body. What his thoughts are about courage, patriotism, fidelity, cheerfulness under great suffering cannot be left to chance. Stray standards picked up at random must be replaced by a true estimate of the relative value of the nobler qualities of manhood, and these, by speech and example, must be inculcated in the soldier by the men who carry his life in their hands.

"The reiterated choice of good or evil gradually determines character," writes George Eliot. That principle must be the standard throughout all training; nothing must be slipshod. All must choose between right and wrong action, between laxness and exactness, between devotion to duty or selfish ease and interest. So character may be built up to that supreme height where every soldier must stand ready to give his life to remain the captain of his soul.

German Principles of Command in the Defensive Battle in Position Warfare[1]

I. INFANTRY

ENERGETIC steps must be taken to insist on the infantry in the line continuing their work on their position, even during the fighting. Personal inspection by all infantry commanders, and by the higher commanders, is necessary to ensure this.

By night, and especially in misty weather, for example, it will often be necessary to strengthen the garrison of the front line or to bring reserves up closer to the front line. In foggy weather, a special form of "readiness for action" must be provided for.

Gaps between defensive works are a source of danger. They must be commanded by fire from the rear and the flanks, and be kept under observation by the infantry and artillery. By night and in misty weather they should be guarded by outposts.

The main points to be considered in the stationing of all reserves are to keep them concealed and to distribute them skilfully over the area, so as to avoid unnecessary losses. Isolated farms, copses, hollows and roads which lie in valleys should be avoided, as experience teaches that they are always heavily shelled.

When fighting takes place in open country or in positions which afford but little cover, efforts must be made to hold the front line with weak detachments, while the rest of the force is distributed in great depth, as would be the case in a strongly constructed position.

When a hostile attack begins with prolonged intense artillery preparation by the heavy and heaviest calibers of artillery and trench mortars, the foremost trenches are speedily converted into shell-hole positions, in which infantry "nests," composed of isolated groups, are formed round the sentry posts and dugouts, wherever these still exist.

It is essential that the men should be trained to connect up such points with each other and with the trenches in rear during pauses in the fighting, by night or during misty weather.

The influence of the company and subordinate commanders in fighting in such shell-hole positions often extends only to the men who are actually with them. In such circumstances, stout-hearted men with iron nerves form the real backbone of the defense. All commanders in the front line, senior or junior, must, however, continually endeavor to keep their men capable of offering resistance and ready to make a counter-attack, by setting a personal example of calm and courageous behavior.

In fighting of this character it is no longer advisable to strengthen the garrison of the fighting line and to reinforce it continually. The garrison sustains heavier losses, which are continually recurring and which, because they are unnecessary, are bad for the *morale* of the troops. The maintenance of the foremost positions, moreover, cannot be ensured simply by a rigid defense, com-

[1]March, 1917.

bined with the reinforcement of the garrison of the front line.

To secure this object, tactics of a different character must be employed.

The garrisons of the foremost trenches must be weak, but they should not be tied rigidly to one point when they can no longer find cover and may, within certain limits, change their position in order to escape from a very intense bombardment. Experience shows that, no matter how carefully the enemy directs his fire, there are points within every area allotted to a unit in which this fire is less effective. It is, therefore, a question of observing the fall of the enemy's fire, and of avoiding the areas in which it is most intense by advancing, moving to the flanks, or falling back on the nearest supports. The best method is to advance, as this is the quickest way of escaping from the enemy's fire. In movements to the flanks or towards the rear to the nearest supports there is some danger of the continuity of the firing line being broken, and of the enemy establishing small nests in it unobserved. Efforts must, therefore, be constantly made by the detachments in the shell holes not to lose sight of one another, and the front line must be continually under observation from the rear.

If the enemy leaves his trenches to attack our lines, every infantryman must realize that the most certain means of repelling the attack are his own rifle fire, hand grenades and the bayonet, and that even a few machine guns will break up a hostile attack. The employment of artillery is a valuable assistance in repelling an assault, but it is not of itself sufficient to repulse a strong attack.

Every rifle and machine gun which can be brought to bear on the enemy's attack, either from the firing line or from defensive positions in the rear, must be directed against it, in addition to the annihilating and barrage fire of the artillery, trench mortars and bomb-throwers (*Granatenwerfer*).

If, in spite of this, the enemy succeeds in entering our trenches, the task of the artillery is to cut him off from the attacking waves and reserves which are following him up, while enfilade and frontal fire (rifle, automatic rifle, and machine gun) is opened on the enemy who has entered our trenches, to prevent his further advance. Trench mortars and bomb-throwers, in particular, should be employed to keep the enemy under fire while he is consolidating the position, although the artillery may also take part in this if observation can be ensured.

The difficult situation in which the enemy now finds himself must be utilized without waiting for further orders. The detachments of the trench garrison who are retiring to the flanks and to the rear, and the supports lying ready behind the foremost trenches, whose task must have been so drilled into them as to become second nature, must counter-attack immediately and recapture the front line. They must in some cases advance under hostile artillery fire. The enemy must be annihilated to the last man by the use of the hand grenade and the bayonet in hand-to-hand fighting.

An essential preliminary to the successful employment of these tactics is to make certain that the infantry can observe the foreground and the area between the lines.

Men detailed to guard particular points (emergency garrisons) do not take part in counter-attacks.

If the counter-attack is successful,

the front line must immediately be placed once more in a state of defense, but the garrison must then be reduced to its previous strength. *These tactics cause the fighting to take place not in, but for, the front line.*

It is essential that the men should be thoroughly trained in these tactics, and that the subordinate commanders and men are given clear, precise, and detailed instructions as to what they have to do, on the spot. The utmost demands must be made on every man who takes part in the attack.

If the garrison of the foremost battle zone is unable to eject the enemy or hold him, a combined attack should be delivered with the general reserve while the enemy is still engaged in organizing the defense of a strange system of trenches and in fighting the local reserves for "holding on" points, etc. Every man who is fighting in the forward battle zone must realize clearly that by holding out, even if he is completely surrounded, he makes it easier for the counter-attack which is certain to be delivered, and is contributing to his own relief. He must, therefore, go on fighting so long as he can use his weapons.

The attack itself should be delivered in waves in extended order, assault detachments being employed at some points. The attack must be supported by the fire of machine guns pushed forward in echelon, by bomb-throwers and trench mortars, by infantry guns, as well as by the artillery farther in rear. The success of the attack depends, not on the strength of the forces engaged in it, but on the resolution with which it is carried out, the cooperation of all arms, and rapidity of execution.

A decisive factor in the success of an attack is the selection of the right moment for the employment of the reserves posted farther in rear. It must be remembered that many requests for support from the front line are, as experience shows, either not justified by the situation or made too soon. If the reserves are alarmed and brought up prematurely, their energy is frittered away and the subordinate commanders are tempted to hold the front line with too large a force.

If an immediate attack does not succeed in ejecting or annihilating the enemy who has entered the position, this can only be retaken by a methodical attack.

Reliefs.—The frequent relief of the infantry is undesirable from the point of view both of command and of the troops themselves, as the change prevents the troops becoming familiar with the position and diminishes their keenness in working to improve it.

Experience shows that confusion often arises while the relief is being carried out, and ground is lost in consequence.

Precautions must be taken in advance to insure that there are other communications which have been reconnoitered and clearly marked out to replace routes which have been discovered by the enemy and are blocked by his fire.

II. ARTILLERY

Searching and sweeping fire (unless it can be kept within narrow limits by working with the assistance of suitable registration points situated close to the target, combined with an exact study of the map) and bursts of fire with H. E. shell against groups of the enemy's guns are, as a rule, useless. On the other hand, searching and sweeping fire with gas shell may be very useful to put artillery out of action for the time being. Gas shell are not suit-

able for counter-battery work which aims at the destruction of the hostile battery.

When the trenches are separated by medium distances (about 165 to 220 yards), barrage fire should fall on and close in front of the enemy's foremost trenches, as otherwise the safety of our own trench garrison, which is not to be jeopardized on any account, cannot be ensured. If the enemy's jumping-off trenches are so close to our own lines that barrage fire would endanger our own infantry, it must be left to the trench mortars, bomb-throwers, and infantry to keep them under fire. The artillery barrage fire should then be directed against the enemy's rearward positions in order to cut off his foremost waves of assault from their supports and to catch the latter while they are concentrating. If the enemy's foremost trenches are farther from our lines, *i. e.*, more than 330 yards, the barrage fire must follow the progress of the enemy's attack.

Artillery action against the enemy's *tanks* is of particular importance in the repulse of an attack, in view of the novelty of the weapon and the small amount of experience so far gained.

Destructive and barrage fire, which is directed against hollows, roads, and the enemy's positions, will probably often stop tanks by its very intensity, so that only a few will reach or penetrate our lines.

Artillery action against these will be carried out by infantry guns and close-range guns which fire with direct laying at short ranges. They are equipped with a special projectile for this purpose. It is important that these guns should not open fire too soon, so that they remain concealed and are still in action when they are needed.

In addition to these guns, heavy howitzer batteries should be detailed to engage tanks. They will have particular zones allotted to them as targets, *i. e.*, as a rule, strips of ground close in front of our lines which they can keep under observation, and on which they must register when conditions are quiet. If a tank enters the zone allotted to a battery, all the guns should be turned on the tank and salvos should be fired until it is put out of action.

Nothing but a thoroughly organized bombardment such as this will be successful against tanks. General orders that all batteries which observe tanks approaching are to open fire on them only lead to confusion and failure.

In exceptional cases, heavy flat-projectory guns, firing with direct laying and direct observation, may prove effective; for example, if tanks have broken through our lines.

Artillery Commands.—The artillery allotted to armies to reinforce them for the defensive battle should, in principle, be distributed amongst the divisions in proportion to the importance of the various divisional sectors.

Artillery should not be massed; distribution in depth causes the enemy to scatter his fire.

III. AIR FORCES (INCLUDING ANTI-AIRCRAFT DEFENSE)

It is necessary to increase the air forces very considerably—reconnaissance and artillery aeroplanes, single-seater battleplanes, captive balloons, and anti-aircraft weapons—before the actual defensive battle, as the first objective of the enemy's attack will be to secure complete mastery of the air. This must be stopped as soon as possible.

As soon as the reinforcement of the

threatened front is ordered, owing to the situation having become clear and the decision to thwart the enemy's plan having been taken, the air forces and anti-aircraft weapons must be further considerably increased. Less important fronts must without hesitation be ruthlessly denuded of aeroplanes, balloons, and anti-aircraft weapons.

IV. PIONEERS

(*a*) Pioneers are on no account to be employed on tasks which the infantry is capable of performing.

(*b*) The pioneer commander of the division is also in command of the pioneer battalion of the division. The pioneer and *Minenwerfer* companies and the searchlight section of the division should be under his orders, and, as a rule, the labor companies as well. The divisional commander will arrange for the command of the pioneer and *Minenwerfer* companies and searchlight units, which are temporarily attached to the division.

(*c*) In a defensive battle, *Minenwerfer* have a special task to perform in engaging *tanks*. Special zones in front of our lines, which they must be able to keep under observation with certainty, should be allotted to the heavy and medium *Minenwerfer*, in the same way as to the heavy artillery. If tanks enter these zones, the *Minenwerfer* concerned will divert their fire from all other targets and direct it on the tanks.

Medals[1]

By Lieut. Col. Fred R. Brown, Infantry, National Army

MEDAL (Fr. *médaille*, from Lat. *metallum*), strictly the term given to a memorial piece, originally of metal, and generally in the shape of a coin, used, however, not as currency but as an artistic product. "Medallion" is a similar term for a large medal, but is now usually restricted to a form of bas-relief in sculpture. The term "medal" is, artistically, extended by analogy to pieces of the same character not necessarily shaped like coins.

MEDALS AS WAR DECORATIONS

Although the striking of medals to commemorate important events is a practice of considerable antiquity, yet the custom of using the medal as a decoration, and especially as a decoration to do honor to those who have rendered service to the state in time of war, is comparatively modern. It has been supposed that the circular ornaments on the Roman standards had medals in their centers, but there is no evidence to show that this was the case, and the standards shown on the column of Trajan appear only to have had plain bosses in their centers. It is true that the Chinese are said to have used military medals during the Han dynasty (first century A. D.), but as far as the West is concerned, we have to come to the sixteenth century before we find the custom of wearing medals as decorations of honor a recognized institution.

The wearing of decorative medals was common in England in the reign of Henry VIII, but the first medals commemorating a particular event that were evidently intended as a personal decoration, and were in all probability (though there is no absolute proof) bestowed as reward for military services rendered to the Crown, are the "Armada" medals of Queen Elizabeth, 1588–1589.

Other European nationalities were also about this period conferring decorative medals as a reward for war services, as, for example, the "Medal to Volunteers" issued in Holland in 1622–1623, and the "Military Medal of Gustavus Adolphus," issued in Sweden in 1630. Here it may be noted that in following the history of medals as used as a decoration to reward military services, only those of British origin need be dealt with in detail, since Great Britain has utilized them in a much greater degree than any other nationality. The countless minor wars of the nineteenth century, waged by the forces of the Crown of every class, navy, army and auxiliary, have no equivalent in the history of other states, even in that of France, the United States and Russia. The great wars of the nineteenth century were divided by long intervals of peace, and the result is that with most of the great military powers the issue of campaign medals has been on a small scale, and in the main decorations have taken the form

[1]References: *Encyclopedia Britannica; Journal of the Military Service Institution; Field Almanac*, 1917; *Compilation of Orders, War Department; Uniform Regulations and Specifications.*

of "Orders" (see Knighthood and Chivalry: *Orders*), or purely personal decorations for some meritorious or exemplary service.

No medal awards were made to either the naval or military services for the Seven Years War and the American War of Independence. In fact, George III had been more than thirty years on the throne when the first medal award by the Crown was given, in the shape of navy gold medals, first issued in 1794.

THE UNITED STATES

The Medal of Honor

The Medal of Honor for the Army was first established as a reward for military services by a law approved July 12, 1862, as follows:

Resolved, by the Senate and House of Representatives of the United States of America, in Congress assembled, That the President of the United States be and he is hereby authorized to cause 2,000 "medals of honor" to be prepared, with suitable emblematic devices, and to direct that the same be presented in the name of Congress to such noncommissioned officers and privates as shall most distinguish themselves by their gallantry in action and their soldier-like qualities during the present insurrection.

This was followed by an act (March 3, 1863) to the effect—

that the President cause to be struck from the dies recently prepared at the United States Mint for that purpose "Medals of Honor" additional to those authorized by the Act of July 12, 1862, and present the same to such officers, noncommissioned officers and privates as have most distinguished or may hereafter most distinguish themselves in action; and the sum of $20,000 is hereby appropriated out of any money in the Treasury not otherwise appropriated to defray the expenses of the same.

The original medal is described as a

five-pointed star, tipped with trefoil, each point containing a crown of laurel and oak; in the middle, within a circle of thirty-four stars, America, personified as Minerva, stands with her left hand resting on the fasces, while with her right, in which she holds a shield emblazoned with the American arms, she repulses Discord, represented by two snakes in each hand; the whole suspended by a trophy of two crossed cannons, balls and a sword surmounted by the American eagle, which is united by a ribbon of thirteen stripes, palewise, gules and argent and a chief azure, to a clasp composed of two cornucopias and the American arms.

Gen. E. D. Townsend (late Adjutant General of the Army) says:[1]

As soon as news of the Civil War in the United States became known in Europe many persons who had been officers in foreign armies came to offer their services to the Government. It frequently happened that these gentlemen brought letters of introduction and testimonials of their military career. Sometimes they came accredited to our Department of State. They usually paid their respects to General Scott, and not infrequently, on such an occasion, wore their uniforms, with all their decorations—medals or orders. There were many men in our volunteer service who had served abroad, and it was quite the habit among them to display on their uniforms such marks of distinction if they possessed them. It is no wonder if they were objects of envy to many of our young aspirants for military glory.

The experience of the Mexican War, when the honor of a brevet was so often persistently sought for through political influence, sometimes without any special military merit to sustain it, early suggested to me the probability that the same evil, in magnified form, would

[1] "Anecdotes of the Civil War," by Gen. E. D. Townsend. New York: D. Appleton & Co.

arise during the Civil War. It was very desirable, therefore, if possible, to prevent what afterwards actually happened—the destruction of the practical benefit arising from the brevet system. Instead of tardy and sometimes indiscriminate recommendations for brevets, why should not our generals, when in command of armies in time of war, be clothed with the power of rewarding distinguished acts of bravery on the instant by issuing orders confirmed and executed by the War Department? Mistakes would rarely, if ever, be made; and the excellent effect of a prompt recognition of gallantry in battle is no new thing in history.

Impressed with these ideas, I, early in 1861, urged their adoption upon General Scott and upon the chairman of the Senate Military Committee, the Secretary of War, and others in influence. They objected that it was contrary to the spirit of our institutions to wear decorations, and therefore the measure would not be popular. I instanced the pride which children felt in wearing medals won at school and the pains taken by parents to foster it, and suggested that if those who won medals did not choose to wear them they would none the less value them, and so would their descendants after them. Nothing was done in that direction, however, until the 12th of July, 1862, when Congress passed a resolution to award medals of honor to enlisted men, which, by the Act of March 3, 1863, was extended to officers also. These medals, although intrinsically of but little value, have been eagerly sought for and highly prized. The main objection to them is the mode of conferring, under which years have sometimes elapsed before sufficiently reliable testimony could be obtained that the claimant was justly entitled to one, according to the terms of the law.

The new Medal of Honor now consists of a five-pointed star, in the center of which is a medallion bearing the head of "Minerva," and on the disk surrounding the head are the words "United States of America," in relief. On each point of the star is an oak leaf, and encircling the design is a laurel wreath enameled in green. Surmounting the star is the word "Valor," and resting upon the same is an eagle. The medal is suspended from a concealed bar by a blue ribbon, upon which is woven, in white, thirteen stars, to represent the original States. The silk lapel button is made of hexagonal shape. The background is of blue, with thirteen stars woven upon it in white.

The ribbon worn upon the Service uniform in lieu of the Medal of Honor is a section of ribbon three-eighths of an inch long, mounted on a concealed metal bar.

"Indian Wars" Medal

On the obverse is a mounted Indian, facing to the right, wearing a war bonnet and carrying a long spear in his right hand. Above the group are the words "Indian Wars," and below, on either side of a buffalo skull, the circle is completed by arrow heads conventionally arranged.

An Indian warrior, in fighting trim, mounted on his small pony, is the nearest modern approach to the ancient Greek horseman, as represented on the frieze of the Parthenon, and besides being significant of the active and troublesome enemy in the frontier campaigns is particularly adapted to the design in relief.

On the reverse is a trophy composed of an eagle perched on a cannon supported by five standards, significant of the five great wars in which the United States Army has been engaged, namely, the Revolution, the War of 1812, the Mexican War, the Spanish War, and the Philippine Insurrection. With the

standards are rifles, an Indian shield, spear and quiver of arrows, to suggest the Indian Wars, a Cuban machete and a Sulu kriss. Below the trophy are the words "For Service." The whole is surrounded by a circle composed of the words "United States Army" in the upper half and thirteen stars in the lower half.

The ribbon is a simple band of bright red, with a narrow stripe of deep red on either edge. Vermillion is the favorite color of all savage tribes, and particularly of the North American Indian, and for this reason it was selected. The narrow stripe of deep red was added to distinguish this ribbon from others, notably from that of the Legion of Honor.

The Civil War Medal

On the obverse is the head of Lincoln, nearly in profile, facing to the right, surrounded by these words, taken from the Gettysburg oration, "With malice toward none, with charity for all."

On the reverse are the words "The Civil War," and below this the dates "1861–1865," the whole surrounded by a wreath formed of a branch of oak on the left and a branch of olive on the right, the stems joined at the bottom by a conventional knot or bow.

The head of Lincoln was selected because his portrait on the medal would be acceptable both in the North and the South, particularly when accompanied by the noble phrase which so tersely and accurately expresses his attitude during the war.

The ribbon is composed of two bands of red, white and blue, with the red on the outside and the blue stripes separated by a narrow stripe of white. The significance of the red, white and blue needs no explanation, and the reason for the narrow white stripe between the blue stripes is to distinguish this particular ribbon from others, like the Loyal Legion, the wearing of which is authorized by the War Department.

"Certificate of Merit" Medal

On the obverse is a Roman war eagle, with wings partly raised, the head in profile to the left, surrounded by the inscription "Virtutis et audaciae monumentum et praemium." The eagle was taken from the most perfect representation of a Roman war eagle in existence, the life-sized marble antique in the possession of Lord Wemys, formerly Lord Elcho, well known for his great interest in the British volunteers.

On the reverse are the words "For Merit," in a wreath composed of two branches of oak, the stems joined at the bottom by a conventional knot or bow, the whole in a circle composed of the words "United States Army" in the upper half and thirteen stars in the lower half.

The ribbon is composed of two bands of red, white and blue, with the blue on the outside and the red stripes separated by a narrow stripe of white. The significance of the national colors is apparent, and the narrow white stripe between the red stripes is to distinguish this ribbon from others in which the red, white and blue are contained.

A certificate of merit granted to an enlisted man for distinguished service entitles him, from the date of such service, to additional pay at the rate of $2 a month during military service, whether as an enlisted man or as an officer, although such service may not be

continuous, and is payable in full to a retired enlisted man.

"War With Spain" Medal

On the obverse is a conventional castle, adapted from that on the arms of Spain, with the addition of two round corner towers, suggesting the type of the Cuban Morro, the whole in a circle composed of the words "War With Spain" in the upper half, and in the lower half the date "1898" at the bottom, with a branch of the tobacco plant on the left and a stalk or sugar cane on the right.

The reverse is the same as that of the "Indian Wars" medal.

The ribbon is composed of bands of blue (each 3/8 inch), separated by a band of yellow (3/8 inch), with a border of yellow on each edge (1/8 inch). The yellow is the Spanish color, and therefore appropriate, and the blue was adopted to distinguish this ribbon from another, the wearing of which is authorized by the War Department.

The "Congressional" Medal

On the obverse is a group composed of a color-bearer holding the United States flag and supported by two men with rifles on their shoulders, the three facing the left. The flag extends to the rim between the words "Philippine" and "Insurrection." Below the group is the date "1899."

As this medal was voted by Congress to be given to the soldiers who followed the flag in the Philippines under unusual circumstances, it seemed appropriate to represent a color guard of soldiers in campaign dress bearing the United States flag. The medal is given to both regulars and volunteers, and has therefore a special design on the reverse. This consists of the words "For Patriotism, Fortitude and Loyalty" in a circle composed of a branch of pine on the left and a branch of palm on the right, the stems joined by a conventional knot or bow. The pine and the palm are intended to signify that in this campaign, as in the Spanish War, the men from the North and from the South fought under the same flag.

The ribbon is composed of a broad band of blue, with a white stripe (1/16 inch), separating it from bands of red, white and blue on either edge. This design differentiates this from other ribbons, and the only significance of the colors and their arrangement is that the combination of red, white and blue is a favorite one among the Filipinos, and was adopted by them as their national colors.

"Philippine Insurrection" Medal

On the obverse is a conventionalized cocoanut palm tree. On the left of it is a Roman lamp, significant of enlightenment, and on the right, balances or scales, symbolizing justice. The whole is in a circle composed of the words "Philippine Insurrection" and the date "1899" at the bottom.

The palm tree was often made use of by the Romans on their coins, etc., to record their conquests on the southern shores of the Mediterranean. It was this use of the palm tree that suggested its appropriateness for this medal. The reverse is the same as that of the "Indian Wars" medal.

The ribbon is composed of a broad band of blue, with bands of red on either side and a narrow border of blue on the edge. It was obviously impossible to use the Filipino colors, as they are the same as our own, and

blue was chosen as the prominent color in the combination to differentiate this ribbon from others and to give it a special character.

"China Relief Expedition" Medal

On the obverse is the Imperial Chinese five-toed dragon, with the head in full face in the middle, the whole in a circle composed of the words "China Relief Expedition," with the dates "1900–1901" at the bottom.

The Imperial Chinese dragon is often represented in a circle, and this favorite design naturally suggested the adoption of it for this medal. The Chinese always draw the dragon with the pearl of immortality not far away from his open mouth, but the significance for use on the medal is complete without the pearl. The reverse is the same as that on the "Indian Wars" medal.

The ribbon is composed of a broad band of yellow, with a narrow edge of blue. The significance of the yellow is apparent, as it is the Imperial color, and the narrow stripe of blue on the edge was adopted to distinguish this ribbon from another, the wearing of which is authorized by the War Department.

Army of Cuban Pacification Badge

(*a*) *Badge.*—To be of bronze, 1¼ inches in diameter. On the obverse side is a group composed of the coat of arms of the Cuban Republic, supported by two American soldiers with rifles, at parade rest. Above the group are the words "Cuban Pacification." Below the group are the dates "1906–1902." The reverse side is the same as that on the "Indian Wars" badge. The badge is suspended from a brass bar (3/16 inch long by 5/16 inch wide) by a silken ribbon (1⅜ inches in length) of the same description and width as that described below.

(*b*) *Ribbon.*—To be of silk and composed of a band of olive drab (⅝ inch), with a blue stripe (⅛ inch) separating it from bands of white (⅛ inch) and red (⅛ inch) on either side, the whole to be 1⅜ inches wide by ⅜ inch long.

Army of Cuban Occupation Badge, 1898–1902

(*a*) *Badge.*—To be of bronze, 1¼ inches diameter. On the obverse side is the coat of arms of the Cuban Republic. Above the coat of arms, around the circumference, are the words "Army of Occupation, Military Government of Cuba," and to the left and right, respectively, above the shield of the coat of arms, the numbers "1898" and "1902." The reverse side is the same as on the "Indian Wars" badge. The badge is suspended from a brass bar (3/16 inch long by 1 5/16 inches wide) by a silken ribbon (1⅜ inches in length) of the same description and width as that prescribed below.

(*b*) *Ribbon.*—To be of silk and composed of a band of red (⅜ inch), a yellow stripe (1/16 inch), a band of blue (⅜ inch), a yellow stripe (1/16 inch), and a band of red (⅜ inch), with a border of blue (1/16 inch) on each edge, the whole to be 1⅜ inches wide and ⅜ inches long. (C. U. S., No. 1, July 9, 1915.)

Rosettes or buttons of approved pattern, to consist of ribbons of the same color as those that pertain to the several service medals and badges, are authorized for optional wear with civilian clothing on the part of those persons to whom such medals and

badges have been awarded or may be awarded, in lieu of the medals or badges to which such rosettes or buttons pertain, respectively.

Presentation of Medals of Honor.—The presentation of a medal of honor to an officer or enlisted man in the military service, awarded under the joint resolution of Congress approved July 12, 1862, and the Act of Congress approved March 3, 1863, will always be made with formal and impressive ceremonial.

The recipient will, when practicable, be ordered to Washington, D. C., and the presentation will be made by the President as Commander-in-Chief or by such representative as the President may designate.

When not practicable to have the presentation at Washington, the details of time, place and ceremony will be prescribed by the Chief of Staff for each case.

On campaign the presentation will be made by the division or higher commander (Ex. Order, September 20, 1905, Par. II, G. O. 158, 1905—956103, M. S. O.)

Announcement of Awards of Medals of Honor and Certificates of Merit; Honorable Mention of Meritorious Acts.—Awards of medals of honor and certificates of merit will be announced from time to time in general orders of the War Department, and honorable mention of gallant or specially meritorious acts of officers, enlisted men, and others serving in or with the Army will be published, in the discretion of the commanding general, in general orders of the department or tactical division in which the service is performed. (G. O. 109, 1888, as amended by G. O. 86, 1902.)

Issue of the Philippine Congressional Medal for Enlisted Service in the Regular Army.—The medal provided for by the act of Congress approved June 29, 1906, will be issued by the Quartermaster General of the Army, upon application and proof of identity, to those men who enlisted, or re-enlisted, in the Regular Army between April 21 and October 26, 1898, for service during the War with Spain, who were accordingly entitled to their discharge from that service at the close of the war under the provisions of the orders of the War Department, and who did not avail themselves of the privilege of discharge conferred thereby but remained in the service to help suppress the Philippine insurrection, and who were subsequently honorably discharged as of that enlistment or re-enlistment, or who died in the service. Upon application this medal will be issued to the proper legal representative of any deceased enlisted man who, if living, would be entitled to the same. (Par. I, Cir. 11, 1908—1213796, M. S. O.)

Certificate of Merit Badges and Campaign Badges, Authority for Issue.—1. By authority of the President, a badge with ribbon will be issued to each officer and enlisted man in the service to whom a certificate of merit has been or may hereafter be issued; a badge to be issued for each certificate of merit awarded. The badge and ribbon thereof are a part of the uniform and will be worn as prescribed in the Uniform Regulations.

2. By authority of the President, campaign badges with ribbons will be issued as articles of the uniform to officers and enlisted men in the service to commemorate services which have

been or shall hereafter be rendered in campaign. The badges and ribbons will be worn as prescribed in the Uniform Regulations.

Announcement will be made by the War Department designating campaigns for which badges will be issued and defining the conditions of award.

Civil War, Indian, Spanish, Philippine, and China Campaign Badges, Award of.—The following instructions concerning the award of campaign badges are published as a substitute for all previous orders and circulars on the subject subsequently to General Orders, No. 4, War Department, January 11, 1905, paragraph 66, this compilation:

In accordance with the provisions of General Orders, No. 4, War Department, January 11, 1905, certificate of merit badges, and campaign badges as named below, of the patterns in the office of the Quartermaster General, will be issued to officers and enlisted men, including those on the retired list, who were in the military service of the United States on January 11, 1905, or at any time thereafter. The badges will be issued to the proper legal representative of any such officer or enlisted man who has died since January 11, 1905.

(*a*) *Civil War Campaign Badge.*—For service in the Regular or Volunteer Army or in the militia in the service of the United States during the Civil War between April 15, 1861, and April 9, 1865.

(*b*) *Indian Campaign Badge.*—For service in the following named campaigns against hostile Indians or in any serious action with hostile Indians in which there have been killed or wounded upon the side of the troops; decision to be made in each case of the latter class, upon individual application, whether the action concerned was such as to be properly considered serious within the meaning of the order:

In southern Oregon and Idaho and northern parts of California and Nevada, 1865–1868.

Against Cheyennes, Arapahoes, Kiowas, and Comanches in Kansas, Colorado, and Indian Territory, 1867, 1868 and 1869.

Modoc War, 1872 and 1873.

Against Apaches of Arizona, 1873.

Against Kiowas, Comanches, and Cheyennes in Kansas, Colorado, Texas, Indian Territory, and New Mexico, 1874 and 1875.

Against Northern Cheyennes and Sioux, 1876 and 1877.

Nez Percé War, 1877.

Bannock War, 1878.

Against Northern Cheyennes, 1878 and 1879.

Against Utes in Colorado and Utah, September, 1879, to November, 1880.

Against Apaches in Arizona and New Mexico, 1885 and 1886. The operations of officers and enlisted men who served with Troops C, E, F, and L, Third Cavalry, from Fort Davis, Tex., and detachment of Troop M, Third Cavalry, from Camp Peña Colorado, Tex., in June and July, 1885, in preventing hostile Apache Indians from entering the State of Texas, form part of this campaign.

Against Sioux in South Dakota, November, 1890, to January, 1891. The operations of the command of Lieut. Col. Edwin V. Sumner, Eighth Cavalry, on the Cheyenne River, S. Dak., from November, 1890, until January, 1891, and of Troops F and G, Eighth Cavalry, which proceeded from Fort

Yates, N. Dak., to the camp of Sitting Bull at the time of the skirmish which resulted in the death of that Indian, form part of this campaign.

In such minor campaigns as involved marches, camps, and bivouacs by troops actually in the field and operating against hostile Indians.

The question of the issue of Indian campaign badges for service in campaigns other than those herein designated by name will, in each case, be decided on its merits, upon individual application.

(*c*) *Spanish Campaign Badges.*—For service on the high seas en route to, or ashore in—

Cuba, between May 11, 1898, and July 17, 1898.

Porto Rico, between July 24, 1898, and August 13, 1898.

Philippine Islands, between June 30, 1898, and August 16, 1898.

Service on a United States Army hospital ship en route to or in the immediate vicinity of Cuba, Porto Rico, or the Philippine Islands, between the dates specified, constitutes service for which the Spanish campaign badge may be issued.

(*d*) *Philippine Campaign Badge.*—For service ashore in—

Philippine Islands, between February 4, 1899, and July 4, 1902.

Department of Mindanao, Philippine Islands, between February 4, 1899, and December 31, 1904.

In the following expeditions:

Against Pala and his followers, Jolo, Philippine Islands, April and May, 1905.

Against Datu Ali and his followers, Mindanao, Philippine Islands, October, 1905.

Against hostile Moros on Mount Bud-Dajo, Jolo, Philippine Islands, March, 1906.

The fact of service in any one of these three expeditions will be certified to by the commanding officer of the organization in which such service was rendered.

Philippine campaign badges to commemorate service in campaigns other than those designated above will only be issued to such officers and enlisted men as have actually served in the field against an enemy in an action in which there have been killed or wounded on the side of the troops participating.

(*e*) *China Campaign Badge.*—For service ashore in China with the Peking Relief Expedition, between June 20, 1900, and May 27, 1901.

An officer or enlisted man of the army who rendered, while an officer or enlisted man of the Navy or Marine Corps, service that would have entitled him to a campaign badge had it been rendered as an officer or enlisted man of the Army, is entitled to such campaign badge.

A contract surgeon or dental surgeon is entitled to a campaign badge only for service rendered by him in campaign as an officer or enlisted man.

Service as a veterinarian of cavalry or field artillery is, for the purpose of the award of campaign badges, considered as if rendered as a commissioned officer.

Only one Indian campaign badge and only one Philippine campaign badge will be issued to an officer or an enlisted man, notwithstanding the fact that service may have been rendered in more than one Indian or Philippine campaign.

Where the service of a person

has not been honorable subsequently to the campaign for which a badge is claimed, he will not be listed for such badge. If the service of any person subsequently to the date of his being listed for a campaign badge shall not be honorable, the proper commanding officer will notify the Adjutant General of the Army in order that the badge may be withheld.

Service Badges, Army of Cuban Occupation and Army of Cuban Pacification.—By authority of the President, a service badge with ribbon will be issued to officers and enlisted men who were in the military service of the United States on June 28, 1915, or at any time thereafter, and who served as officers or enlisted men in Cuba with the Army of Cuban Occupation between July 18, 1898, and May 20, 1902. A service badge with ribbon will also be issued to officers and enlisted men who were in the military service of the United States on May 11, 1909, or at any time thereafter, and who served as officers or enlisted men in Cuba with the Army of Cuban Pacification between October 6, 1906, and April 1, 1909. The badges and ribbons will be issued as a part of the army uniform, gratuitously to enlisted men, and at cost price to officers, and will be worn as prescribed in the Uniform Regulations.

When the service of an officer or enlisted man has not been honorable subsequently to his service with the Army of Cuban Occupation, or the Army of Cuban Pacification, he will not be listed for a badge, and if the service of any officer or enlisted man subsequently to the date of his being listed for a badge and previously to its issue to him shall not be honorable, the proper commanding officer will notify the Adjutant General of the Army in order that the badge may be withheld.

Badges of military societies may be worn by officers and enlisted men who, in their own right or by the right of inheritance, are members of military societies of men who served in the armies and navies of the United States in the War of the Revolution, the War of 1812, the Mexican War, the Civil War, or the Indian Wars of the United States, the Spanish-American War and the incidental insurrection in the Philippines, or the China Relief Expedition, or are members of the Regular Army and Navy Union of the United States, or of the Army and Navy Union of the United States.

The various distinctive marks awarded for excellence in marksmanship, the aviator's badge, and the swordsman's badge may be worn with the full dress, the dress, and the service uniforms. However, they will not be worn in the field.

Order in which worn.—They will be worn in the following order of precedence, beginning at the right:

1. *Military, naval and other badges and medals awarded by the Government.*—(1) Certificate of merit badge (issued by the War Department); (2) Medal commemorating the Battle of Manila Bay (issued by the Navy Department); (3) Medal commemorating the naval engagements in the West Indies (issued by the Navy Department); (4) Special meritorious medal for service during the War with Spain, other than in battle (issued by the Navy Department); (5) Philippine Congressional medal (issued by the War Department); (6) Campaign

badges in the order of the dates of the campaigns (issued by the War and Navy Departments); (7) Gold life-saving medal (issued by the Treasury Department); (8) Silver life-saving medal (issued by the Treasury Department); (9) Army of Cuban Occupation badge (issued by the War Department); (10) Army of the Cuban Pacification badge (issued by the War and Navy Departments); (11) Good-conduct medal (issued by the Navy Department); (12) Aviator's badge (issued by the War Department); (13) Various distinctive marks awarded for excellence in small-arms practice (issued by the War and Navy Departments); (14) Swordsman's badge (issued by the War Department); (15) Medals or badges awarded for service performed while in the Army, Navy, or Marine Corps, or other branch of the Government, if not included among those specified above.

2. *Badges of military societies and corps and divisions.*—(1) The badges of military societies commemorative of the wars of the United States, including the Philippine Insurrection and the China Relief Expedition, in the order of the dates of such wars; (2) The badges of the Regular Army and Navy Union of the United States, and of the Army and Navy Union of the United States; (3) The corps and division badges of the Civil War and the War with Spain; (4) The badge of the Enlisted Men's Abstinence League.

Footwear

By Captain J. H. Van Horn, 22d Infantry

RECENTLY it became apparent to the writer that certain changes as regards quality, or different methods of construction, or both, would be desirable in the latest type of shoe and legging as now issued us by the Quartermaster Corps. In every other respect, as far as is known, these articles are thoroughly satisfactory. Their shape, design and principle we believe to be correct, but they positively do not give the soldier the amount of wear we are justified in expecting.

The opportunity which was presented at the training camp of the First and Second Provisional Training Regiments was ideal for an investigation of this matter. All members of the camp were outfitted with clothing simultaneously, so the collection of the necessary data was comparatively simple.

As to the local conditions under which these articles were tried out, it might be stated that they were especially favorable and fair. It was very rare indeed when the shoes or leggings were wet in the course of the day's work. Practically all of the marching was done on good roads. The shoes were, of course, kept indoors when not in use. They were frequently cleaned and otherwise subjected to little of the rough usage and wear of actual service. The data collected cover the individual experience of the entire personnel of three companies of the First Provisional Training Regiment, or 493 men, and are as follows:

SHOES, LATEST QUARTERMASTER ISSUE (PAIRS)

Time in service	*Soles worn through*	*Back stay stitching ripped*	*Welt stitching on inside of instep ripped*
8 weeks	209 pairs	103 pairs	34 pairs
7 weeks	15 pairs	8 pairs	2 pairs
6 weeks	40 pairs	24 pairs	6 pairs
5 weeks	8 pairs	6 pairs	1 pair
4 weeks	35 pairs	16 pairs	3 pairs
3 weeks	1 pair	.....	2 pairs
2 weeks	2 pairs	.....	2 pairs
Totals	310 pairs	157 pairs	50 pairs

LEGGINGS, INSTEP STRAP, SIDE LACE (PAIRS)

Time in service	*Defective stitching*		*Cases in which one or more hooks pulled out*
	Ankle bone	*Elsewhere*	
8 weeks	120 pairs	50 pairs	52 pairs
7 weeks	8 pairs	3 pairs	2 pairs
6 weeks	34 pairs	9 pairs	20 pairs
5 weeks	7 pairs	3 pairs	7 pairs
4 weeks	51 pairs	20 pairs	30 pairs
3 weeks	18 pairs	5 pairs	13 pairs
2 weeks	15 pairs	8 pairs	9 pairs
1 week	7 pairs	1 pair	10 pairs
Totals	260 pairs	99 pairs	143 pairs

In taking into consideration these figures it must be remembered that more than 75 per cent of the individuals questioned had two or more pairs of shoes in use during all of this time. The wear was, therefore, distributed, and subjects the issue articles to but 50 per cent of the total for the period referred to.

The above information points to the necessity of improving our shoe in at least three respects:

1. The shoe should be half-soled with chrome-tanned leather before leaving the factory, or a full-length sole added to the present sole, according as to which is the more economical or otherwise desirable.

2. A method should be devised which will protect the stitching of the back stay from the rubbing of the legging.

3. That some means be employed to hold the sole to the shoe at the welting on the inside, near the instep. The breaking of the stitching at this point permits the entrance here, between the layers of leather, of small pebbles or dirt, and in a short time results in a bruised spot on the sole of the foot. Shoes breaking in this manner go to pieces and lose their shape comparatively soon. This mechanical defect might be remedied by driving three or four nails into the sole, thus holding it more firmly together.

It has been found that in every case where half soles, as well as extra lifts to the heel, were added to the new shoe, that the following results could be counted on with certainty:

1. It will hold its proper shape four or five times as long as the shoe now issued.

2. It will be in a serviceable condition two or three times as long.

3. It very materially adds support to the foot, especially to those inclined towards weak arches. (The individual quickly gets accustomed to the extra weight and does not mind it.)

The changes recommended will, if adopted, alter in no way whatever the design of the present shoe, but will do much toward making it a much better balanced shoe as regards durability. It might be stated, too, that a more serviceable shoe string could well be adopted. Though the eyelets are extra large and there is an entire absence of hooks on the shoe, these laces last but a very short time.

Regarding the new canvas leggings, it can be seen from the figures given that certain changes in its construction are also in order. Shoemakers to whom great quantities of these leggings have been sent for repair state that the following changes would add considerably to the length of life of this article:

1. A leather reinforcing strip 5 inches by 2 inches sewed to the middle seam, extending from the bottom upward.

2. A rawhide instep strap instead of the present canvas strap.

3. Extra precautions taken to prevent hooks pulling out.

Ammunition Supply

School of Musketry

ANY system of ammunition supply which would be of real value must be based upon the probable expenditure in battle, and also upon the principle that the fighting troops should never find themselves out of ammunition and should never have to turn their backs on the enemy in order to obtain it.

In examining the records of the expenditure of ammunition during the Franco-Prussian War, Russo-Turkish War, Russo-Japanese War, and the Spanish-American War we find that the amounts vary from 10 rounds per rifle (64th Regiment, September 1, 1877, at Omar Bey Tabia, Russo-Turkish War) to 405 rounds per rifle (138th Regiment, October 14, 1904, Battle of Schaho, Russo-Japanese War). Some of the records present totals for Army Corps, and the average expenditure per rifle (only a few rounds in some cases) is misleading, as all parts of the corps were probably not engaged, while some of the organizations were more heavily engaged than others. The tendency during these wars has been towards an increasing expenditure of ammunition, due partly to improvements to firearms, improvement in training, and the development of fire tactics. Fire superiority must now be obtained in the early stages of combat and maintained to the end. Volume of fire, well directed and controlled, partly produced by rapidity of fire, is now paramount, and we must look for heavier expenditures in the future than in the past.

The average number of rounds carried for each soldier in the first line by seven of the leading powers is 219. In the second line they carry 82 rounds. These powers have in each division or corps 301 rounds per man. Our first line carries 220 rounds per man, and our second line, or the divisional ammunition train, a reserve of 120 rounds, giving a total of 340 rounds for each rifle in a division. In order to meet the demands of untrained troops we have wisely provided for more rounds per man than European experience has found necessary. Whether the extra number of rounds we carry will meet the demands of untrained troops and the faster firing of the future can only be determined by the test of war. At present we feel that an average throughout the division of 340 rounds per rifle will carry a man through a hard day's fight, and at the end refill his belt.

DUTIES OF COMMANDERS WHO ARE RESPONSIBLE FOR THE SUPPLY OF AMMUNITION.

Commanders of All Grades.—It is the duty of commanders of all grades to see that due economy is exercised in the expenditure of ammunition and to make provision for its timely replenishment.

No means should remain untried for bringing up ammunition to troops in action and for keeping up the fire, on the maintenance or cessation of which the success of the action may depend.

Commander of the Field Forces.—He fixes the amount of ammunition

which shall be kept on hand in the various depots of the line of communications.

Commander of the Line of Communications.—He is responsible for maintaining in his depots the amount of ammunition prescribed by the commander of the field forces. The troops in the field are supplied with ammunition from these depots. The commander of the line of communications procures this ammunition by submitting requisitions to the War Department or to such arsenals as the War Department may designate.

Divisional Artillery Commander.—He is charged with the organization and operation of the ammunition service within the division. He assists the division commander in locating the ammunition refilling point and the ammunition rendezvous point.

Commander of the Ammunition Train.—He directs the ammunition service of the division and commands the train in which is carried the reserve or extra ammunition of the division. When a battle occurs he is responsible for the placing of sections of his train within convenient distances of the troops in action, that they may be kept supplied with ammunition.

Regimental Commanders. — They should supervise the supply of ammunition in their regiments. (See page 270.)

Battalion Commanders.—It is the duty of battalion commanders to regulate the supply of ammunition from the combat train to the firing line and to dispatch the empty vehicles of the combat train to the distributing station to be refilled. They are charged with keeping their combat trains properly filled.

Company Commanders.—Company commanders are responsible for the belts of their men being kept filled at all times, except when the ammunition is being expended in action. They should see that the ammunition of the dead and wounded in the firing line is secured whenever practicable, that ammunition in the bandoleers is expended first, and that 30 rounds are kept in the right pocket section of the belt to be expended only when ordered by an officer.

Platoon Leaders.—They should notify the company commander when the ammunition in the bandoleers becomes expended.

Platoon Guides and Squad Leaders.—They watch the expenditure of ammunition in the firing line and notify the platoon leaders when the ammunition in the bandoleers becomes expended. They assist in maintaining an even distribution in the line and in distributing along the line the ammunition brought forward by reinforcements. They also see that the ammunition in the bandoleers is expended first and that 30 rounds are kept in the right pocket section of the belt to be expended only when ordered by an officer.

OUR CHAIN OF AMMUNITION SUPPLY

Line of Communications.—A line of communications is the route over which supplies are sent from the home country to troops operating in territory of an enemy. Railroads, boat lines, motor trucks, or trains consisting of army wagons furnish the means of transportation along this route. One end of this line is located in the home country and the other end is kept near the troops in the field. A line of communications

may often be so long that one commander cannot give it proper supervision. In this case it is divided into two sections. The end of the line located in the home country is called the base section; the end which is kept near the troops in the field is called the advance section. To each of these sections is assigned an assistant chief of staff, who is authorized to issue orders within his section in the name of the commander of the entire line.

If the line is unusually long, it is divided into three or more sections. The sections between the base and advance sections are called intermediate sections.

Depots are established at the base section and at other points of the line where sufficient supplies are stored to meet the demands of the troops.

In addition to the depots, supply columns are attached to the advance section. These columns consist of motor trucks or trains of army wagons. They are used to push forward from the depots of the advance section such supplies as may be needed by the troops. They are sometimes called movable bases, and they form a connecting link between the advancing troops and the depots of the advance section.

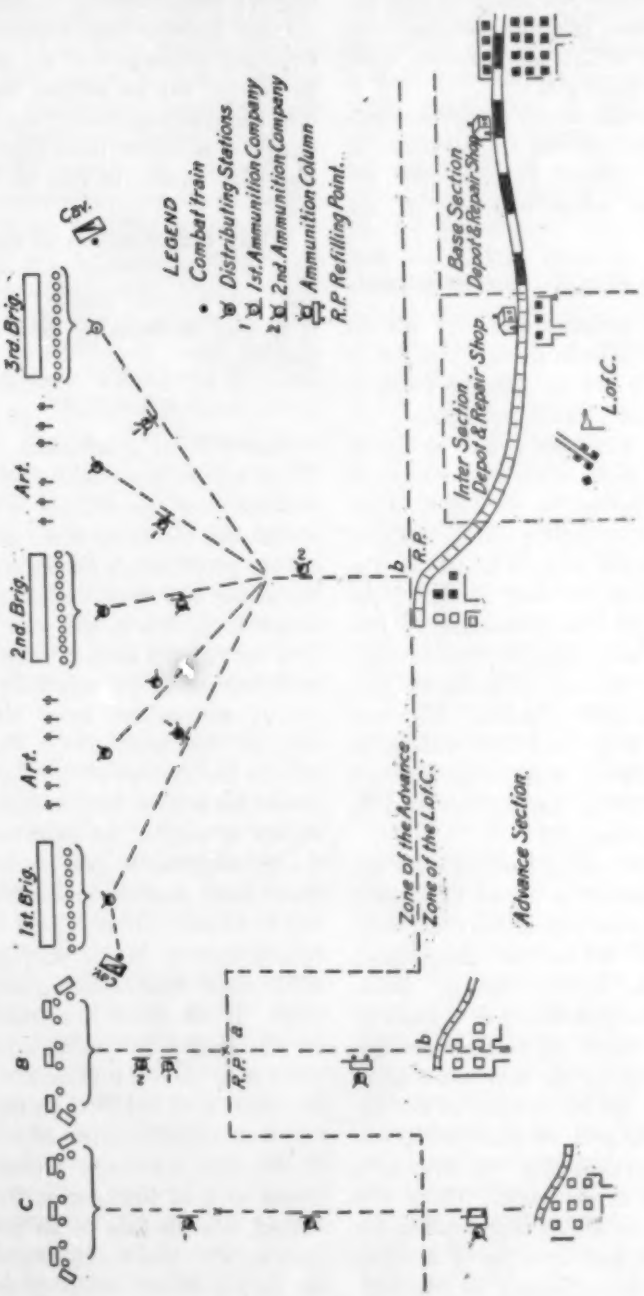
The source of our supply rests in the base section of the line of communications. It has been seen that the commander of this line, by timely requisitions upon the War Department, maintains a supply of ammunition which is fixed by the commander of the field forces. From the base section the ammunition is passed to the advance section of the line of communications by rail, boat, or motor truck. Here it is placed in the ammunition columns. As the field forces move forward into the theater of operations, the advance section with its ammunition column follows, and this column becomes the connecting link between the line of communications and the next agenecy of supply, which is the division ammunition train.

DIVISION AMMUNITION TRAIN

This train consists of 162 army wagons. The draft is a four-mule team, and the road space of the train is about 1½ miles. In a war-strength division marching on a single road the ammunition train would be about 12 miles in rear of the head of the column. It is usually at the head of the division trains which follow the troops. The train is divided into the first and second ammunition companies, and to each is attached a commissioned and enlisted personnel. Each ammunition company is further divided into three wagon companies. This train carries the extra ammunition which a firing line might need in a hard day's fight. It is called the division ammunition reserve, and consists of 2,444,000 rounds of small arms ammunition, and also pistol and artillery ammunition. There is sufficient ammunition in the train to furnish each man armed with a rifle in a war-strength division with 120 rounds and each machine gun with 10,000 rounds. From the division ammunition train combat trains are filled.

COMBAT TRAINS

Each battalion has one of these trains. It consists of three army wagons, and in this train is carried the immediate reserve supply of the battalion, consisting of 120 rounds per rifle.



AMMUNITION SERVICE—DIVISION A.

Each machine-gun company also has a combat train, consisting of one army wagon, in which are carried 6,600 rounds for each gun.

These combat trains march immediately in rear of the organizations to which they belong, unless they are assigned to other positions in the column.

OPERATION OF OUR CHAIN OF SUPPLY

When it becomes necessary for an ammunition column to supply the division train, it proceeds to the front to a place called a rendezvous point. At this point the column is met by agents from the division train who conduct it to a place farther to the front, called an ammunition refilling point. Both of these points are fixed in orders by the commander of the field forces if the force is larger than a division, or this commander may delegate to his division commanders the duty of fixing the rendezvous and refilling points. After the points have been fixed, their location is communicated to the troops and the commander of the ammunition train by division headquarters.

The combat trains connect with the division ammunition trains at a place designated as an ammunition distributing station. When the ammunition train arrives at the refilling point, which is usually within 2 or 3 miles of the line of battle, its commander dispatches agents to the different brigade commanders for the purpose of arranging for the location of distributing stations and investigating the best lines of approach to the same. There will usually be one distributing station for each brigade, and, upon being fixed, its location is communicated to the regimental and battalion commanders by brigade headquarters. Combat trains operate between the distributing stations and points as near the line of battle as they can go without undue risk. The German regulations require these points to be never more than 800 meters (875 yards) in rear of the firing line.

Wheel transportation of ammunition ends with the combat train, and when the ammunition leaves this carrier it is sent forward by pack mules or individuals.

TEAM WORK

That part of ammunition supply in which we are particularly interested is between the ammunition distributing station and the firing line. In examining the procedure, a battalion of infantry going into action as a part of a larger force is a proper unit to study. It is the fighting unit, and the major is held responsible for regulating the supply of ammunition from his combat train to the firing line. The major, who in the absence of instructions has caused his combat train to march immediately in rear of his battalion, causes the ammunition therein to be issued. Each man receives from this supply two bandoleers, which, added to the 100 rounds carried in his belt, gives him 220 rounds upon entering an engagement. If the attack is a deliberate one on the enemy in position, or if our force is to occupy a defensive position, the location of the distributing stations has been communicated to the troops. In this case the major knows at once where to send his combat train to be refilled. In the case of an unexpected meeting with the enemy the conditions are very different. Here team work is a prime necessity. The major will

empty his combat train as previously, but where to send it to refill is now the question. As he must accompany the battalion into action, he would, in the absence of instructions, leave his train with the noncommissioned officer in charge with orders to proceed to brigade headquarters and ascertain the location of the distributing station. At this stage the regimental commander might order the combat trains of the regiment assembled at a selected point to await his orders, in which case he would take steps to locate the distributing station. Each noncommissioned officer in charge of a combat train should thoroughly understand the details of ammunition supply. He should be trained in signaling, in the use of cover, and should be mounted.

At this time let us look to the rear of the column in the vicinity of the division ammunition train to see what team work is necessary there in solving this problem.

When a battle suddenly occurs the commander of trains should be notified at once, and without waiting for orders he promptly releases the ammunition train and directs its commander to press forward with it to the field of battle. The commander of the ammunition train should at once move forward, taking with him his train agents. To locate the probable line of battle and also a point from which practicable routes radiate to the different portions of the line now becomes his duty. In doing this he should bear in mind that the expenditure of ammunition will not be the same in all parts of the line, and he must consider the placing of portions of his train where most needed. It would be necessary for him to get into contact with the commander of the troops in action and get his views on the situation. He would then send his agents to get into contact with the brigade commanders and arrange with them the location of the distributing stations. These agents would examine the roads leading to the stations and report their location to the commander of the ammunition train as soon as possible. After learning the tactical situation of the troops, and after receiving the reports of his train agents, the commander of the ammunition train would make his estimate of the situation. As his train came forward he would meet it, and either hold it together at a selected place for further developments or send sections of it to the distributing stations.

The positions of the ammunition train and its different sections, when the latter are separated from the main train, are marked by a red flag during the day and by a red lantern at night.

To revert to the combat train. The noncommissioned officer in charge of it, upon ascertaining at brigade headquarters or from the regimental commander the location of the distributing station, would lead his train to the station, refill it, and return with it to the battlefield, taking up a position selected by the regimental commander. It is from this point that the greatest difficulty will arise in supplying ammunition. We will assume that by the time the combat train has been refilled and returned to the battlefield the battalion support has joined the firing line; that the battalion commander has signaled for ammunition; that the regimental reserve is under cover about 600 yards in rear of the firing line; that the combat train is under cover about 400 yards farther to the rear, and that while it

cannot reach the regimental reserve without undue risk, sufficient cover exists to protect pack mules in traveling to and fro. The two pack saddles carried in the combat train would now be put into use. Two leaders would be unhitched, saddled, and each packed with two boxes of ammunition. The driver would then lead them forward to the reserve, delivering 4,800 rounds at each trip. Means could easily be improvised for packing more of the animals if necessary, as the new metallic packing box lends itself readily to this kind of handling. From the regimental reserve the ammunition would be sent forward by reinforcements. If reinforcements were not needed in the battalion, but simply ammunition, then men would be detailed to carry it. In this case not less than one squad for each company to be supplied should be detailed. Squad organization and team work would be helpful in crossing a fire-swept zone. If the ground behind the firing line could not be crossed by these small groups, a chain of men might be formed connecting the firing line with the point of supply. These men would take the best cover they could find, profiting by any protection or inequality of ground, or raise a mound of earth to protect themselves. The ammunition would be forwarded by throwing the bandoleers from one man to the other. The ammunition delivered to the firing line would be distributed along the line by passing and throwing the bandoleers.

The amount of ammunition which each man could carry to the firing line would depend upon his condition, the distance he had to go, and the cover offered by the terrain. If a danger zone had to be crossed, the men would make short rushes at top speed or crawl. Under such conditions they should not be called upon to carry more than five bandoleers per man (about 20 pounds).

Every system of ammunition supply should include the recovering of ammunition from the dead and wounded. From this source a considerable amount would be added to the firing line. In the case of an advancing skirmish line, however, it is not to be expected that much ammunition could be so acquired. The forward movement could not be retarded, and men should not be allowed to drop behind.

Under no circumstances is it proper to send men from the firing line to the rear for ammunition. Preferably, troops that have not been engaged carry it forward, and, upon joining the firing line, remain with the line.

OTHER CONSIDERATIONS

Regimental Commanders.—In our drill and field service regulations no specific duty is assigned to the regimental commander in supplying ammunition. It would seem, however, there must be important duties for him to perform. In the foregoing discussion he has been mentioned twice—in connection with ascertaining the location of the distributing station, and in selecting a position for the combat train after it has been refilled and returned to the battlefield.

When the combat train is emptied, just before the battalion goes into action, and is sent to the rear to be refilled, it may happen that all avenues of approach are filled with advancing troops. The majors for the time being are separated from their trains, so, under these conditions, it would seem

an important duty for the regimental commanders to assemble these trains and direct their movement to the rear.

The trains upon returning to the battlefield should be carefully located with reference to the troops they are to supply. Their nearness to the firing line, cover for the trains, and cover for the pack animals in approaching the firing line are important factors to be considered. And here again is an important duty for the regimental commander.

In supplying an infantry line with ammunition, provision must be made for the machine guns. With the present equipment and organization, about half of the ammunition carried on the pack animals can be taken forward by the personnel of the gun crews. Any additional ammunition that may be needed by the guns should be sent forward by the same methods employed in supplying the infantry. Eight men would be required to carry the 2,400 rounds, loaded in strips, that remain on the animals when the guns move to their first firing position. To provide for casualties among the ammunition bearers, and to supply a sufficient amount of ammunition to carry the guns through an assault and the events subsequent sixteen men, or two squads shouid be detailed for each gun to carry forward ammunition in bandoleers. These sixteen men, or two squads, should place themselves under the orders of the commander of the guns. In order that no doubt exist as to the troops to be detailed to carry forward the machine-gun ammunition, regimental commanders should give the necessary instructions in every case.

IMPROVEMENTS FOR HANDLING AMMUNITION

It might be well to consider here certain improvements which have been made in handling ammunition, and others which should be made.

Probably no better means has ever been devised for the quick and convenient handling of ammunition under trying circumstances than our bandoleer. It is inconspicuous, of light weight, strong and durable, and yet of so little money value that it can be thrown away in emergency. It can be carried on the shoulder, strung on poles, or tied in bundles. Many ways of handling it are possible. It holds a considerable amount of ammunition, which is easily taken from it and which is also held firmly in position during rough handling. This device will be of great assistance in passing ammunition to a firing line. The pin which is attached to the bandoleer is intended for the shortening of the loop when desired.

A note in our Tables of Organization states that, when authority of law has been obtained, the caisson will supersede the army wagon as the carrier of our divisional and battalion reserve ammunition. The transporting of ammunition between the distributing stations and the regimental reserves may often be facilitated by using this caisson. Its mobility will allow it to enter places impracticable for an army wagon. By using the limber as a galloping cart, stretches of ground may often be crossed with speed, and a forward position attained which would be impossible for the army wagon. Where the limber stops the pack mules begin, and between them ammunition could be delivered well to the front.

Germany uses a two-horse company ammunition wagon; England, two-horse two-wheeled carts and pack animals; Russia, two-horse and one-horse carts; Turkey and Japan, pack animals only. All the other countries use two-horse vehicles, which are generally two-wheeled carts.

Our proposed caisson with its four mules will combine the best features of the different European transports with few of their disadvantages.

A provision which has not been made for the service of our combat trains is a wagon personnel. These wagons must be loaded and unloaded, and the mules unhitched, unharnessed and packed. The drivers could not do all the work connected with the train considering the efficiency demanded. It is thought that each wagon or caisson should be accompanied by one man, in addition to the driver. These men would have to be detailed at present from the battalion, and provision should be made for filling their places in the line.

A system of issuing ammunition from the combat trains should be developed, and the following is proposed: The battalion being at a halt, in column of squads or in line, the combat train would move forward. Opposite the center of each company a sufficient number of boxes would be thrown to furnish each man in the company with two bandoleers. Two men from each squad would be detailed to open the boxes, remove the bandoleers, and distribute them in their respective squads.

CONCLUSION

The varied situations of infantry on the battlefield precludes the possibility of formulating any rule which could be depended upon all times to insure a steady flow of ammunition to troops in action. It must be remembered that upon entering an engagement our troops carry 220 rounds per man, and that the case would be exceptional when this amount would require replenishing in a single action or day. Advantage would be taken of lulls in the fighting and of the night to keep this amount of ammunition in the hands of the men. On the defensive, in a prepared position, ammunition could be easily provided and should be in the position in great abundance. On the offensive, in spite of all precautions, portions of the line may run short and have to be resupplied. As there is little probability of finding a method which would suffice in all cases and which would save a commander the loss of time in considering in each case the preferable course of action, it behooves us to analyze our system and try it out under varying conditions and as often as possible.

SMALL ARMS AMMUNITION

	For each man armed with rifle			For each man armed with revolver			For each machine gun			Line of communications			
	With organization		In the ammunition train	With organization		In the ammunition train	With organization		In the ammunition train	In the ammunition column	Advance section	Intermediate section	Base section
	In the belt	In the combat train		In the belt	In the combat train		On mules	In the combat train					
Infantry	100	120	120†	20*	20*	20†	4,800	6,600	10,000†	As ordered	As ordered	As ordered	As ordered
Cavalry	90	60		20*	20*		4,800	6,600	.....				

* If pistol is carried, the number of rounds is 21, 7 for each magazine.
† Except that in a cavalry division the ammunition train carries only 60 rounds per rifle, 10 per revolver, and 5,000 per machine gun. Engineers or signal troops requiring ammunition draw from the nearest ammunition wagons.

WEIGHTS OF AMMUNITION AND CONTAINERS—CARRYING CAPACITY, IN ROUNDS, OF PACK MULES AND VEHICLES

	Weight of each unit		Number packed in box	Space occupied by packing box (cu. in.)	Weight of box packed (lbs.)	Carrying capacity (in rounds) of		
	Pounds	Ounces				Pack mule	Army wagon	Auto truck
Ball cartridge for U. S. rifle, model 1903 (in bandoleer wooden box)	....	0.89	1,200	2,704	100	2,400	33,600	36,000
Same in metallic packing chest	....	.89	1,200	1,820	91.5	2,400	36,000	39,600
Caliber .45 ball cartridges, for revolver and also for automatic pistol	....	.80	2,000	2,099	120	4,000	46,000	50,000
Ammunition carried by soldier (100 rounds)	5.6	....	....	....	....	....	....	....
Cartridge belt, caliber .30	1.3	....	....	....	....	....	....	....
Bandoleer (60 rounds)	4.0	....	....	....	....	....	....	....

Machine Guns in Battle

By a French Expert

I. The Machine Gun

THE machine gun is, in short, only a "repeating rifle of great efficiency mounted on a rigid and mobile mount."

"Like the infantry, it fires a bullet of small caliber, that is to say, a light projectile, solid and indivisible, endowed with great penetrating force;" like the infantry, it can be moved rapidly and easily.

But it is a machine with a feed "without soul and without nerves."

It consequently possesses an incontestable superiority of efficiency over the infantry, but, on the other hand, *the machine gun fights only with its fire.*

Finally, the use of the machine gun is specially marked by the direct observation of the fire obtained; the firer at his gun "sees what he does" and mows as he wills.

Further, it is useless to compare the machine gun to artillery; it possesses neither the power of devastation of the artillery nor the range. Therefore the artillery will destroy our machine on each occasion, and generally we shall be unable to do anything against it.

Machine guns, as we see, are not, therefore, called upon to act as a substitute for any weapon, but should act in liaison with other fighting forces.

In particular, the machine gun alone cannot conquer ground; this operation calls for a movement, executed promptly by numerous and homogeneous elements, finishing by the overwhelming of a position. That is the province of the infantry. We shall soon see that the machine guns can, however, assist in such a maneuver in their own way; that is to say, by their fire. (Attacks by German machine-gun companies at the beginning of the campaign.)

Comparison with the automatic rifle, the use of which permits of the association of fire with movement; example, "marching fire."

The general properties of our machine being exposed, it is necessary for us to study its value in detail, because the principles which govern its use in action are based upon the right use of its special qualities, seeking to ascertain how to use it so as to obtain always and everywhere the maximum efficiency.

At the present time the tactical unit of combat is the company of four sections. The fighting organization is the section of two pieces.

The special qualities of the gun are the great power of its fire: (useful effect: $E = \frac{R \times V}{100}$), in which R is the efficiency of fire (measured by the percentage of hits), this efficiency being due to (*a*) the accuracy of the aim; (*b*) the shape of the sheaf of bullets. It is due also to the rapidity of the fire, characterized by its regularity (uniform or variable cadence), whence the rapidity and uniformity of delivery.

Further, the delivery of the bullets and the shape of the sheaf are functions of the mechanical construction of the weapon and the instruction of the personnel.

Accuracy of fire is an important factor of the *ballistic value of an arm,* which depends also on the curve of the trajectory (danger zones) and the *useful effect of the projectile* at each distance (deadly up to the extreme sight setting).

USEFUL EFFECTS OF THE PROJECTILE

The useful effect of a plain bullet consists in its force of penetration. That varies with the nature of the projectile, its form, its velocity, and the angle at which it meets an obstacle; also with the kind and state of this obstacle. At 200 meters the bullet D penetrates 83 centimeters of earth; at 400 meters the bullet D penetrates 82 centimeters of spruce; at 1,000 meters the bullet D penetrates 30 centimeters of spruce. (The penetration of the bullet is given by the tables.)

RICOCHETS

Definition.—It is said that a bullet ricochets when, having struck the ground at a small angle, it glances off from it instead of burying itself.

Angle of Incidence; Angle of Ricochet.—Ground smooth and somewhat hard; angle of ricochet, twice the angle of incidence.

At short distances, angle of incidence being very small, the angle of ricochet equals four times the angle of incidence.

Proportions and limits: Upon damp or ploughed ground, perpendicular to the direction of fire, at least 70 per cent of the shots ricochet at less than 800 meters, 50 per cent at less than 1,500 meters.

On firm and smooth ground the bullets which strike the ground at less than 1,500 meters generally ricochet.

At greater distances the proportions diminish; it is still at least 40 per cent at 1,800 meters.

Ground with a slight slope, decreasing the angle of fall, favors the production of ricochets.

At 2,400 meters 34 per cent of the bullets still ricochet.

Bullets ricochet up to 3,200 meters (15 per cent angle of fall: 18 degrees).

Flight of Ricochet.—At short distances, 10 to 15 meters (can attain 40 to 50 meters).

Bullets which have ricocheted do not all produce oblique imprints upon a target. About 45 per cent of them make round holes that one can distinguish from those not having ricocheted by the absence of blackish traces left upon their contours.

Dispersion in Length.—On account of the rifling of the gun, the ricochets have a slight deviation to the left of 2 to 3 degrees.

If, in ricocheting, the bullets have been deformed, they describe a very irregular trajectory and produce a characteristic noise.

Lateral Errors.—Variable with the nature of the ground in general, covering a zone of at least 100 meters (70 meters to the left of plane of fire and 30 meters to the right).

The ricochets constitute a factor which is by no means negligible, since the penetration of bullets that have ricocheted is often more than sufficient to put a man out of action, even at very long distances.

In addition, they contribute a good deal to the moral effect of the fire by their shrill and peculiar noise. (Example for taking count of ricochets.)

The other qualities peculiar to machine guns relate to organization for battle.

1. The invisibility and mobility of the gun and consequently of the section, due (*a*) to the reduced strength of the personnel; (*b*) to the ease with which the gun can be transported or moved from place to place; (*c*) to the rapidity with which it can be put into battery or taken to pieces.

2. The facility of directing firing, which is always in the hands of the chief, who has only to deal with one or two men.

3. Finally, the machine gun itself only requires a front of 2 meters for going into action (mountains, passes, etc.).

II. Action of Machine Guns

Machine guns act solely by fire, but from this fire results of different character may be obtained:

1. Destruction—"firing to kill."

2. Fire maneuvers: (*a*) neutralization and breaking down; (*b*) demoralization.

Considering the weapon, its various effects should always be *rapid* (surprise) and often *decisive;* that is to say, crushing.

In reality it is admitted and proved superabundantly by examples that:

1. Machine guns can absolutely prohibit a zone of ground to the enemy.

Troops cannot cross a machine-gun barrage fire when it is suitably directed and sufficiently concentrated. (Attack at Andechy, November, 1914; Champagne and Artois offensives, September, 1915.)

2. Sustained machine-gun fire directed on a position or a shelter occupied by troops makes either or both untenable (enfilade of rectilinear trenches) or else prevents the garrison from making efficacious use of its firearms (neutralization).

3. The noise of machine guns in action dominates the din of battle; often accompanied by the crackling of the bullets in the air, it has an especially sinister and nerve-racking sound. This crackling is enervating and demoralizing, giving as it does the impression of something regular, methodical, and continuous, the pitiless working of which nothing can stop. The moral effects of the machine gun have been known from the time of the Russo-Japanese War: "Its regular crackling," said Lieutenant Colonel Neznamow, "calm in the midst of the furious tearing of repeating fire, acted powerfully and in an inverse sense on the nerves of both sides." (Use of rattles; demoralizing firing.)

This being established, the tactics of machine guns consist, then, in choosing and employing such means of working and taking them into action as will produce one or the other of these effects, according to the situation of the unit to which they belong; in deciding on the manner in which they shall be divided among the different elements of this unit; what assistance they can, under such or such circumstances, render to this unit, according to their firing capacity; and, finally, how they shall be placed so that their firing capacity can be utilized to the best advantage at the desired time and place.

It can be seen that the part played by a machine-gun company enters into the various combinations of the chief of the battalion to which it belongs, in the same way as do the companies of riflemen.

The idea of a machine-gun unit as a reinforcement or firing reserve, ac-

cepted for separate sections from the beginning of the campaign, must disappear with the present organization, which allows of the machine guns being used in the various conditions of infantry warfare.

But to obtain these results the first condition is a *thorough knowledge of the organism of the machine gun itself* that it may be worked to the utmost efficiency, and the *various formations of the section*, in order to profit to the full, on the ground, of its incomparable adaptability.

I will not speak now of the internal organization of the company (which is treated elsewhere) or of the service of the piece (dealt with in the 1912 Regulations), but will study exclusively the maneuvering of the section in the company.

III. Tactics and Evolution of the Fighting Organization

In war the depressing influences of combat, which cannot be represented at maneuvers, make themselves felt proportionately to the power of the armament to the detriment of the effort of the troops and according to their moral worth.

"Man is capable of a given amount of terror, beyond which he escapes from the combat."—*Col. Ardant du Picq.*

Therefore, with the methods of destruction that exist at the present time, no one, I think, would dare to boast of never having felt fear on the battlefield. The instinct of preservation can make the strongest tremble, but they have sufficient will to overcome this feeling. Fear, which with them never becomes terror, is then forgotten in the preoccupations of battle.

"Action kills fear."

The first object to attain in tactical instruction is to teach the men "to fight with their maximum of energy—maximum which can alone give the organization to counteract fear."

This organization will be based on confidence, solidarity, discipline, and cohesion.

In order to be sure of being able to bring up close at hand and in good condition all his means of warfare, the section commander "should be able to rely on the qualities of his personnel under all circumstances and without reservation." (Machine-Gun Officer's Manual.)

This personnel should, therefore, be instructed with a view to forming a supple, not rigid, group, accustomed to team work and to the division of duties, trained by actual and frequent maneuvers, in scattered formation—maneuvering of each man, infiltration, scrupulous utilization of the ground. G. Q. G. Note of October, 1916, on Methods of Instruction for Machine Gunners.)

On the other hand, never at any epoch has the individual bravery of the soldier been of greater importance. We must therefore endeavor to arouse individualism—an essentially French quality—to develop in the machine gunners (on account of the diversity of their functions in battle), but always bearing in mind the one end of a united action, in order to obtain the automatic and rapid dispersion of the group by a methodical and frequently executed deployment.

The carrying out of certain evolutions, in presence of such or such circumstances of warfare, will thus become normal and habitual. It renders pos-

sible maneuvering under fire (principally artillery) which should be able to be effected in case of need, but avoided in general.

Finally, at no price must a troop of average worth be exposed to sudden violent and deadly fire; this would be asking for trouble.

I do not lay stress upon route formations (columns of route), which all rest upon the small weapon, the gun.

THE ADAPTABLE ASSEMBLING

During the period of waiting between the road march and the beginning of the battle, this formation should be taken whenever the enemy's artillery might reach us. (Arrangement fan-shaped.)

FORMATION FOR ADVANCE

This should form the object of special instruction in machine-gun units.

In reality, machine guns can be used on all ground that is practicable for infantry; our small transport wagons, and especially our pack animals, pass over all average obstacles, and the personnel, with its load, should be able to pass everywhere that the infantryman does. They will take a little longer time, but they will get there.

In battle it is not a question of rushing forward to show oneself, but of being there, with all our means of action, to injure and destroy the enemy, which by us is done in the following manner:

Bring up a number of guns proportionate to the effect desired, place them with discretion, and disclose them suddenly by means of a carefully prepared fire, the first effect of which will be crushing.

A man who is out of breath or bewildered fires badly. Care must be taken that the combatant does not lose his calm; frantic men will one day or another spread panic around them.

The machine-gun section should enter into action after a methodical march to combat position, during which the men feel, in spite of the noise of battle, the projectiles, the barrage fire of the artillery, in spite of the losses often already in the height of battle, when "blind and invisible death is in the air with its appalling breath which makes us bow our heads," that their commander is there, that he knows what he is doing, and is calmly carrying out a carefully matured plan.

As a matter of fact, from the unloading position, the men know that they are going into battle, and it is at this moment that they have to take up their important and heavy burden, thus adding the bodily effort necessary for the transport of the material to that contraction of the heart which accompanies their entrance into the furnace. This is a hard moment for the machine gunner. It precedes progression, often long, sometimes exhausting (battles in Champagne, 1915). This should be taken into consideration and the fatigue of the men should be reduced as much as possible. (Method of transport of material; extra fatigue duty required of the battalion.)

It is true that the machine gunner carries no knapsack, but his gun weighs 23 kilos.; and when he is wanted at the firing line, sometimes in very difficult situations, he gets there with his gun in spite of everything. His only preoccupation is to mount his gun in time to use it.

Neither the machine gunner nor the firer, loader and assistant loader can do anything alone, and they defend

themselves with difficulty, but the grouping of the three gunners forms a whole that is capable of action. Let us, therefore, in ordinary times, before the battle, separate these three men as little as possible, and during the progression which precedes the putting into battery keep them around or behind their commander in the order of the different rôles they have to fill. In route formation place the gun crew with reference to the gun commander. (Formation for the advance.)

We will now suppose that the chief of the machine-gun section, moving from one sheltered position to another until he reaches the last, has been able to bring his men up near the firing line. Glasses in hand, he now studies the ground with great care, accompanied by his range finder man, if he has one, but in any case by a messenger.

This is the reconnaissance, which is of the utmost importance and should always be scrupulously performed now that it is possible in all cases, since the chief mission of the automatic rifle is to permit of the installation of the machine guns being made suitably and without haste.

This is the consideration that will guide the section commander during his reconnoitering — "Action before protection." The first condition is action; the second is to remain invisible or sheltered, in order to escape from the artillery, which can alone destroy it. He will *afterwards* think that, opposite him, there is someone searching *his* ground with better glasses than his own and endeavoring to locate his section.

It is therefore important that no indication shall betray the machine guns while they are yet behind the scene of battle, especially at the moment when they leave their last shelter *to go into battery.* The section commander must, therefore, plan in advance all the movements of his section, foresee every incident, even losses, and seek to place his guns at the chosen spot by infiltrating his group in the organization of the whole. (Going into battery one man at a time.)

Firing positions or the gun emplacements should fulfill the condition of maximum of efficacy with a fire of short duration (rapid and decisive effects).

QUALITIES OF THE FIELD OF FIRE

(*A*) With a view to the best action—that is to say, the reaching and destruction of a given objective—the field of fire should be:

Clear (without interference).

Extended (permitting the ground to be covered up to the guns).

Well oriented.

Orientation

Definitions and comparisons; frontal fire; sweeping; oblique fire; enfilading fire (maximum effect); reverse fire.

Flank protection. Advantages (ballistic and tactical)—

(*a*) From the point of view of destruction (efficiency — form of the sheaf): Economy of firing organization; is specially efficient against usual formations of attack (linear); combines well with the movements of friendly troops.

(*b*) From the point of view of demoralization: Projectiles fall on the men from a direction from which they fear nothing (surprise).

(*c*) From the point of view of invisibility (loopholes).

The indisputable conclusion to be drawn from the preceding is as follows. It comprises three ideas for application:

1. As a general rule, place the machine guns so that they can enfilade any formations which may come into the field of fire; that is to say, sweep them in range lengthwise of their greatest horizontal dimension.

"Before anything else, we must endeavor to carry out good flank protection. A firing line is defended less by direct fire than by flanking fire, and the machine gun is, above all others, the flanking weapon." (Chief of Section's Manual, 1916.)

"A chief in command of a machine gun who employs it simply to strengthen his firing line is using only a part of what has been given him. If he makes use of his gun for flanking protection and choose beforehand several emplacements for it from which it can play on various points, according to the contingencies that arise, he is utilizing it fully.

"Flanking is extraordinarily efficacious. It should be frequently recommended to at first organize only the flanking arrangements of a position and to construct the position itself afterwards." (Extract from a German document on Field Fortifications, June, 1915.)

Precautions which necessity demands:

(*a*) The flanking gun defends an entire zone, which is no longer absolutely prohibited to the enemy when the gun is destroyed. It must, therefore, be doubled (two machine guns).

(*b*) The flanking gun is generally detached from the front it is defending and is placed either in front or in rear of a firing line. It is therefore, in certain cases, very exposed. It must be protected (supports, passive defenses).

(*c*) It necessitates at times the placing of guns in a neighboring sector. The liaison of one unit with another (battalions) is thus indispensable.

(*d*) It frequently calls for an exact limitation of the zone of sweeping in direction, to avoid injuring our own lines.

2. Look for flatness of trajectory (no dead angles).

3. Look for the tiers of fire (spacing of guns).

(*B*) In order to escape from injury by enemy's artillery (protection)—

1. When fire is systematically directed on a zone (suspected by the enemy; firing for ranging):

Always avoid placing the guns at spots that can be pointed out: (*a*) On the ground (borders of a wood, open spots, small covered areas); (*b*) or on a map, by a sketch or photo from aircraft (marks, organizations, works).

2. When fire is clearly directed on the section (adjusted):

Remove the guns, but render immediate note of it.

Numerous future emplacements connected with the others by recognized paths, sheltered, covered or defiladed, fulfilling all conditions for the accomplishment of a determined mission.

3. In certain situations: Shelters, proof against large-caliber shell, can be utilized or constructed for the guns and their crews. These will be the object of special mention in another lecture, and their carrying out will depend generally on the circumstances of the battle, on the ground, the weather, and on

the men and the material at our disposal.

IV. Fire Direction

This comprises: (*a*) The conduct of firing, properly so called, opening and cessation of fire; deciding on the kind of the fire to be employed; observation of its effects; watching of the objective; supervision of the way the men work; fire discipline.

(*b*) Fire direction, which comprises: Choice and designation of objectives; estimation of distances; indication of sight setting and the point at which to aim; adjustment of fire.

The direction of fire belongs exclusively to the section chief, who communicates with his gunners. During firing the gunner repeats all the words of command, indications or orders of the section chief, and insures the execution of same.

For the fire direction of a machine-gun section we will refer to the Regulations of November 25, 1912, Volume I, and to the 1916 Memorandum, the provisions of which can be completed by the following observations:

Fire has decisive or rapid action only when well directed (elevation, range finder, ranging practice) on guns or organizations the destruction of which is disconcerting to one's adversary.

The object is, therefore, determined by the momentary tactical importance of the objectives which may arise.

Tactical importance being equal, we must first cover those objectives which, by reason of the extent of their unsheltered surface, their front and density, are the most vulnerable—this, in order to affect the enemy at the first blow by rapid losses.

The section chief should *on his own initiative and in all circumstances open fire whenever he is certain that the assistance of his guns will contribute materially or morally to success.*

Opening and cessation of fire is by word of command, by whistle, or by sign (a tap on the right shoulder of the gunner).

Designation of objectives, with reference to targets which can be seen.

Need of sketch for adjusting fire.

Adjustment: Exact from the gunner's habits of careful observation of the points at which the projectile strikes the ground (fire directed according to these points).

Changing the objectives necessitates sometimes a change of position.

Advantages of a large number of emplacements chosen in advance, access to which is by easy routes, and of the arrangement of the guns in tiers.

Supply of ammunition, and incidents that delay or arrest firing; use of signals.

Kinds of Fire

In order to act usefully, the section chief should be thoroughly acquainted with the situation, the plans of the command, and the progress of operations, and should not have any preoccupation as to what is taking place at the rear with regard to supplies.

The noncommissioned officers and men who are behind the firing line must do their utmost to insure the proper supplies to enable those at the front to fight and live.

In view of the present organization, a machine-gun section will rarely be called upon to act alone in its own section on the field of battle. Always in liaison, either by ordinary methods or by cross-fire, with other neighboring

sections, it will have, generally speaking, a well-defined zone of supervision, and its chief, in constant communication with the other sections of his company and the supporting infantry on the one hand and with his captain on the other, will be kept well informed of the fluctuations of the battle, and will consequently appreciate the value of the objectives which he sees.

The kinds of fire specified by the regulations a few years ago included series firing and intermittent firing. I think it well to employ them in certain cases, in spite of the silence of the present regulations on this subject.

Series Firing.—For example, fire so many rounds or belts.

Variable.—Permits the consumption of ammunition being supervised.

Intermittent Firing.—Gives the firing direction momentarily to the gunner, allowing the section chief to give his attention elsewhere.

Fire with gun unclamped at average rate, with or without sweeping, is used most frequently in the open field. This is easily understood.

Fire with gun clamped is useful on defensive to cover special points of ground, obligatory directions of approaches for enemy, principally by night time (enfilade barrage).

Fire to Be Used Against—

Massed Formations.—Estimate its effects beforehand; before releasing fire, study carefuly how it will sprinkle the objective, how the objective can be kept under the action of the sheaf of fire the longest time possible.

Progressive Fire.—Searching fire or firing on a zone with variable sight settings; fire with gun clamped in direction (objective immobile and narrow); fire sweeping in direction with one or two guns with different sight settings, normal sweeping, scissors sweeping with two guns.

Columns of four or twos—suppleness required in following them in flight.

Columns of one; will only be really vulnerable when it comes approximately into the firing axes (enfilading fire).

Infiltration.—This is the most scattered formation that can obey orders. It consists of movement one at a time; also of the bound forward of two or three men together. It is, in short, insignificant objective moving furtively and rapidly in the midst of all the irregularities of the ground and the upheavals of the battlefield. A single machine gun will have practically no effect on one man, leaping from one shelter to another, at more than 400 meters. At a nearer distance, if the firer is attentive, he will fire a few cartridges at a rapid rate and will try to get the enemy in his sheaf by watching the object with care and patience. (Advantage of intermittent fire.)

At more than 400 meters, with the present uniform, the eye alone is not sufficient. An observer with glasses becomes necessary, which rather complicates the question. But at less than 1,200 meters, machine guns in great number, with easy fire,[1] can prevent infiltration. Several guns should be directed on nearby points, but different from those on frequented passages.

Conclusions

It is useless to lay down any method or doctrine for the section chief; the

[1] Unlimited—free.

machine gun must act according to the occasion and the nature of the battle, without systematic considerations with regard to the kind of objective or of the maximum elevation.

"In the small corner of the battle where he is operating, the section chief should see and endeavor to understand everything, in order to be able to act on his own initiative with a full knowledge of the means at his disposal. In conformity with the ideas of his chief, he decides on the firing position, shelters, approaches, emplacements of guns; he foresees the connecting up of his section, chooses in advance a number of eventual emplacements, and finally decides in case of need on the advisability of intervention and the procedure to be employed." (Devès, Remy, Roquebert—Manual of Machine Gun Officer.)

In intimate communication with his captain, "he is always guided by the thought that his duty is not to kill all that he sees, but at any cost to stop in time such or such maneuver of the enemy, to immobilize him in a position, to prevent him from making use of his weapons, or to compel him to show himself."

Each time that he can do so, he will discreetly change his position to avoid being spotted.

This, in its principal details, is the part played in battle by the machine-gun section. If we take four chiefs of sections acting in accordance with these principles and having the double care of insuring communication between themselves and with their captain, we shall have an exact idea of the machine-gun company in battle.

MODEL OF ACCOUNT RENDERED OR REPORT OF COMBAT

Machine-Gun Company No. 5—First Section

In the form of brief and precise replies to the following questions:

Who? .....
When? .....
Where? .....
How? .....
How many cartridges fired? .....
Have you had losses? .....
Is your situation changed? .....
What do you want? .....
Date:..... Hour:.....

THE CHIEF OF THE SECTION,
.....

Extracts from "Spade Warfare"[1]

By Heinrich Fitschen

Instructor of the Training Personnel of the 9th Army Corps

INTRODUCTION

TWO things are the main features in the present world's war, viz., the spade in land warfare, and the submarine in sea warfare.

Both are responsible for a thorough revolution in the earlier customary conduct of war. They have brought it about that everything has turned out quite differently from what was expected at the beginning of the war.

Only hesitatingly and reluctantly did we face the "spade warfare." From the earliest times there has clung to us a knightly, joyously fresh recklessness. "No one will imitate our assault." With that we intended to force everything. In vain! Willingly or unwillingly, we had to get down into the earth, seek cover against the destructive effects of modern firearms, and work ourselves toward the enemy somewhat in the manner of a mole.

Thanks to our German thoroughness and adaptability, thanks to the help of our highly developed technique, and with the employment of our extraordinary skill in organization, we have now brought our positions to such a perfection that they can defy all the desperate efforts of our enemy.

. . . . . .

CONCLUSION

Shooting and intrenching are the two accomplishments which the soldier must be master of in "Spade Warfare." But, like every other accomplishment, they must be learned and practiced. Especially the city man, who has scarcely had a spade in his hand up to the time of his being called to the colors, must make up by practice what his comrade from the country has ahead of him.

In long position warfare one must never let up in constantly improving and strengthening his works. One must not allow himself to be lulled into security by a temporary inactivity of the enemy.

Who knows if an attempt to break through will not be made just here? Any indifference would then be bitterly atoned for.

Moreover, spade work offers a healthy counterbalance for the crouching around in narrow holes so inseparably connected with the modern method of fighting. It is absolutely essential that now and then strength be exerted, muscles strained, and lungs expanded. Everyone should, therefore, gladly and willingly handle the spade, if only in the well-understood interests of the preservation of the health of his own body.

APPENDIX

THE SPADE AS A PROTECTING WEAPON

(Motto: *Sweat instead of Blood.*)

Everyone who has lain for a long time in the trenches will agree with me that a greater valuation of the spade was to be observed from day to day.

How difficult it was in garrison to

[1]From booklet published by Franklin Hudson Publishing Co., Kansas City.

get the intrenching tool on the man! Each sought to dodge carrying the unwelcome load. Quite different in the field! Wherever a spade was to be had at hospitals and dressing stations, all grabbed for it, no matter whether they wore chevrons or not. Whoever was lucky enough to get hold of the desired tool never afterwards parted with it. And no wonder! For the spade is the most important protecting weapon in war. With its help we may successfully engage our two main enemies, dampness (cold) and the big guns.

I. CONSTRUCTION OF RAINPROOF AND SHRAPNEL-PROOF COVERS

At first our living places turned out very wretchedly, due to scanty equipment of intrenching tools and also due to our ignorance. In consequence of the setting in of rainy weather, we soon stood in slime to such a degree that many a man squatted behind any tree in order to rest sitting or to pass the night awake so as not to let the dampness overmaster him.

Under certain circumstances dampness is more dangerous than the hostile guns. Unobserved, irresistibly it penetrates the body, and once it has taken hold it does not let go. I made the acquaintance of a young Bavarian on a hospital train. He was only nineteen years old and had rheumatism so bad he could not move his foot. He had had wet feet for five days and his joints were so swollen that his boots had to be cut off.

Did we really have to sacrifice this young fighting strength and doctor him up again at great expense? No, and again no. The spade would have saved him, but he had not learned to use it correctly. Like us at first, he too had deepened some available trench or constructed a new one, laid brush, straw, and some earth over it. During rains the moisture soon trickled down the walls; the thrown-up earth finally dripped down on us, our straw camp became wet, our "cave" uninhabitable. Many fellows continued, notwithstanding, to crouch in this "building." Coughing, rattling in the throat, and losses through rheumatism and lung diseases were the consequences.

First of all, more intrenching tools had to be provided. From the dressing stations, as well as from the hospitals at M——, we received so many short-handled spades, picks, etc., that from that time forward nearly every man had a spade, while at the start there was one spade to about every three men. Officers, first sergeants, and men all reached for the spade and never again parted with it.

Our general dispatched the bicycle company to look up long-handled spades and ordered 6,000 in G——. From the empty houses the bicyclists brought ninety in a few hours, which were distributed on the rolling kitchens and hauled into the valley. Furthermore, the cyclists provided roofing paper, nails, pincers, saws, etc.

Now the work could be taken in hand. We built a model house; so high, or rather so deep, that a man could stand up therein, so wide that one could lie down. Covered with roofing paper, it afforded protection against the inclement weather; buried under a 30-cm. thick earth layer, it afforded protection against shrapnel and shell splinters. A thick layer of straw gave protection against cold and dampness from below. The walls also

must be upholstered with straw, at least one wall, against which a man can lean. A door, frame of poles with roofing paper or tent fly, shut out the draft and permitted the lighting of candles, reading, smoking.

If we have no roofing paper, we take brush, straw, beams, and earth, or boards, doors, window shutters, etc., out of the abandoned houses. The blockhouses may be simpler, also lower. If we strike ground water, we must, of course, stop—dryness above convenience.

"But," many ask, "how can I arrange myself so cosily when I must soon advance again?" To meet this objection, we must differentiate between maneuver and position battles. In the first, only a limited amount of digging-in is to be thought of. Generally they develop after a few days into genuine position battles in which every foot of ground is bitterly contested. The time when a battle was decided on one and the same day is absolutely gone. For weeks, and often for months, no decision can be brought about. A backward and forward fluctuation, a deadlock of the adversaries—these are the characterizations of the modern battle, especially on the long battle front in the west.

For this reason we should arrange ourselves in our strong bomb-proofs as if they were intended for eternity.

If we really must break camp, what harm if we have applied somewhat more industry than was absolutely necessary?

We take along on the tool wagon whatever is serviceable, and we build better the next time than the time before. Practice makes perfect. Niches and linings are built in for the accommodation of knapsacks, cooking utensils, water bottles, etc. Chairs and other things are brought from the empty houses, so that we may feel ourselves comfortable.

II. INSTALLATION OF COMMUNICATING AND RIFLE TRENCHES

The line of attack can be constantly advanced by the installation of communicating and rifle trenches.

It has grown dark, the hostile growlers have sent over their last evening greeting; now our work begins.

Patrols feel their way noiselessly through the foreground and spy out if the enemy has noticed anything of our intentions, and these patrols secure us against any sudden surprise. Pioneers follow on foot, test the ground, and indicate the place where a new rifle trench, a new "village," can be excavated with success. Then we advance with our spades and burrow ourselves into the earth, deeper and ever deeper. Some build the parapet, others the zigzag trenches to connect with the covered position in rear.

The enemy hears the stroke of the spades. He notes that something is up, but knows not where or what. He fires into the air. There is naturally no such thing as aiming in the fog and darkness. If the enemy overwhelms us with rapid fire, we take cover. If he sends only occasional shots, we pay no attention to them, as experience has shown that shots fired at random seldom are hits.

How far we can go forward in this manner depends on the terrain and the distance from the enemy. If we are within several hundred meters, we must no longer show ourselves above the ground. The long-handled spades

excavate the earth to man's depth and throw it to both sides of the communicating trench. Naturally, work is carried on in reliefs. All companies in rear have to furnish a definite number of men. Constantly changing, we burrow day and night as far as one can rapidly take cover.

Have we reached the near vicinity of the enemy and are only 100, 60, 40 meters distant, we must crown the work by a surprise attack and compel the enemy to evacuate the position.

Softly, noiselessly in the morning fog or darkness of the night the silent men of the spade arise from the lap of Mother Earth. Each man has two hand grenades which he hurls at the hostile position as soon as the enemy scents danger.

A hellish alarm breaks loose. The enemy is scared out of his sleep. He hurries to the parapet. He fires a few shots, but does not hit much, since hell is raging round about and echelon after echelon rises from the foremost trench and undertakes the short dash to victory.

Up to the first rifle trench there are no casualties at all, since platoon after platoon, company after company can be brought forward through the communicating and rifle trenches in cover. Above all things, the hostile shrapnel fire is eliminated by this "underground" warfare. Before the batteries have observed where the attack is taking place, the work is completed. At the worst, it can sweep our communicating and rifle trenches in rear, but this causes no damage, provided we have entrenched well. The space between the two most advanced trenches can be taken under fire only with care, as the shrapnel dispersion covers 100 meters and thus easily hits both friend and foe.

Now and then our enemies, especially the English, have so entrenched themselves that even so short a distance as 50 meters cannot be taken without great sacrifices. They have covered their positions with steel plates, charged their wire entanglements with electricity, and so barricaded themselves that the obstacles can be swept over only with streams of blood.

Then it is necessary to have recourse to genuine siege warfare. We, of course, understand how to take fortresses—Liège, Namur, Maubeuge, Antwerp, all give proof of that. We shall also reduce the greatest that may loom up from north to south throughout the whole continent. But in no case must we attempt to assault such strong positions without adequate artillery preparations.

III. THE SPADE IN THE ASSAULT

Even in assaults the spade is our most important weapon of protection.

On reading this sentence many a judge of modern war pricks up his ears. In fact, the spade is as good as not used at all in assaults. The rifle can be employed only to a limited extent. Only the foremost riflemen are allowed to shoot. Generally, fire effect is attained only when we have approached to within several hundred meters of the hostile position. The adversary is too well covered and avoids offering the slightest target. He observes our movements through slits, loopholes, and even periscopes. Very seldom does any cap project above the edge of the trench. Consequently shooting is of little purpose. Only

when the enemy flees can we burn his hide with the blue beans.

The rear echelons are naturally not permitted to fire at all, as they might otherwise endanger their own comrades. With rifle resting on the left forearm, head down, clinging tightly to the earth, thus we lie completely inactive and allow ourselves to be torn by the bullets. Howling and screeching they come flying, these men-killing monsters, bringing death and destruction.

Why in all the world do we not endeavor to furnish protection, even in the open field? Unbuckle the spade as soon as "Lie down" or "Position" is commanded! A few strokes—and head cover is furnished. Lie on the side and dig away the earth from under the body and throw it to the front. Burrow into the protecting earth pile.

The following rows of riflemen use the empty bed and deepen it still more until a kneeling trench has been made out of the lying-down trench. By this kind of spadework breast and head wounds above all are avoided and a great deal gained thereby.

In addition, while at work there is no time for worrying or clinging to mournful thoughts. One is occupied, one fights against the hostile power, and one does not serve merely as a target.

Some regiments, especially pioneers, carry along two sandbags, which are filled during an assault and used as cover. This does not appear to me as suitable, as each echelon must begin the same work anew, whereas with the method proposed each new wave of humanity flows into an already excavated bed.

But what is to be done if the earth is frozen hard? For this a Bavarian comrade who lay in my hospital train has found the answer. He stuck his spade handle behind his knapsack so that the blade covered the head, at least against shrapnel bullets; the knapsack protects the back, and thus again two of the most valuable parts of the body are not entirely without protection. The Bavarian learned this from the Saxons. It seems to me worth while to call general attention to this and to imitate it.

IV. SPADE-WORK AS A MEANS FOR PRESERVING THE HEALTH

By working the spade the soldier maintains his bodily health and activity of mind.

That army will emerge as victor out of the stubborn contest which has already prevailed for many months, which possesses the "longest breath," which can best withstand cold, dampness, as well as the big guns. Thanks to God, we are better prepared by nature to overcome the trials of a winter campaign than our enemy. Our condition as to health was always better than in France. Especially thanks to a rawer climate, we are more proof against cold than the French of the south, for example, not to speak of the Senegalese, Zouaves, Gurkhas, and similar exotic people, who must disappear like snow in the sun.

We have only to keep ourselves healthy and capable of resistance. For this each one must help by taking to heart the following requirements:

Do not give in to idleness, useless grumbling, but always keep busy. Take hold of a spade and pick and improve and intrench your position constantly. Endeavor to deceive aviators by fitting your protected position to the terrain,

by covering it with sod, planting bushes, etc. Build dummy trenches and lay a couple of old rifles and helmets on top, and laugh in your sleeve when the enemy wastes his ammunition on them.

Clean your surroundings of sources of contagion and sickness, the bodies of fallen animals, that poison the air. Build good, covered latrines. That is frequently the first thing arranged for by the officers, but you, comrade, have no keenness therefor and work superficially and badly; therefore later on the disgusting conditions in your surroundings. This must not be.

If you lie in woods, as I always do, a road must be cleared out first of all, to make it impossible to go wrong in going with messages, in going for straw, water, etc. Trees are blazed with the axe, underbrush removed, hollows filled in, swampy places corduroyed, and the whole road sprinkled with straw, so that one knows his bearings at night and during a fog. Similarly, the paths to the spring, the strawstack, the dressing station, etc., are marked by scattering straw.

Try to acquire a taste for living in the woods and caves. You certainly enjoyed reading "Robinson Crusoe" in your youth. Then show, comrade, that there still slumbers in you a trace of the daring and spirit of adventure of your ancestors. Try to discover the weaknesses of the adversary through bold reconnaissance. Observe by mirror what your enemy is doing in the close-by rifle trench when you no longer dare to look over the edge of yours.

Crawl through an underground passage to that bush standing 5 or 10 meters in front of your trench and which covers you so splendidly. From there you can observe everything going on across the way. The adversary has his eye only on the rifle trench and does not suspect that you, fresh thing, are sitting in front, and he wonders whence come the bullets that buzz about and land whenever the point of a nose shows itself.

Enough! You, comrade, can see along what lines you can and must keep busy in order to keep yourself in condition.

Your spade is your helper and inseparable companion. Working with the spade keeps the blood in circulation, hardens the muscles, encourages the appetite, and keeps you fresh and well. That is a thousand times better than squatting in your structure and allowing the cold and moisture to get in their work.

"But the hostile bullets," you answer. Many a friend of mine has besought me not to expose myself to danger, to think of wife and children. But for the very reason that I wanted to return home well, I did not remain upon the wet straw. For three consecutive nights I scarcely got a wink of sleep, in order not to permit dampness to overmaster me and in order to render or supervise pioneer duties in the woods.

As a matter of fact, the danger of being hit by a bullet is not so great as many think. You must accustom your ear to the gruesome-beautiful symphony of the battle concert. Down there in your fox-hole you cannot distinguish whether the strong tones, which carry the whole tone structure with the "mighty bass foundation," are being coaxed from the instrument of your friends or enemies. You only hear a hellish noise and start with fear at

every heavy blow and report, at every roar and outburst.

Come out into the light! It is our guns that have taken the hostile village under fire. Look there; the shot landed! The stable is beginning to burn. A little to the right, and that house must succumb. All these shots come from our friends; soon you will be able to distinguish them clearly from the hostile ones. These, also, you need not fear more than necessary. Every battery is given the task of taking this or that hostile position under fire and proceeds quite systematically. For evident reasons, dispersed fire is almost entirely out of use. If the firing is intended for other positions, you may remain quietly at your post of observation and pursue your occupation.

But if the enemy takes your wood or trench under fire, then quickly into your "castle." Cover, complete cover. Do not show so much as the tip of your boots. Then let the enemy waste his ammunition. If you have entrenched well, you need not complain of any losses. On one day we had but two, and the following day but one wounded in the whole regiment, although the enemy overwhelmed us with a continuous stream of iron hail.

It is criminally careless to keep out during hostile fire, to walk about as on maneuver, as some do to show their coolness. Every useless and wanton casualty weakens our power of resistance and directly serves the enemy.

Each who has read these arguments will give the spade the place it has earned. No one will any longer dodge carrying the intrenching tool. Whoever is already sitting in a trench will supply himself with a spade from a wounded comrade. But you, comrade, approaching recovery in a hospital, and you, new one, who wish first to be initiated into the secrets of life in woods and caves, under no circumstances leave the garrison without a spade.

As every soldier must have his spade, so every company must have its tool wagon, upon which are to be carried axes, pick-axes, saws, pincers, packages of nails and screws, roofing paper, water bags, binding twine, and, above all, *long-handled* spades.

Then practice yourself in the use of intrenching tools. Learn it better until you have surpassed the adversary. Keep your spade bright and sharp!

The spade wins over the shells.

It is the key that opens the hostile positions. By its use you preserve your health, your mental and bodily freshness, and your enterprise.

Above all things, do not let your courage sink, even though you stand up to your knees in mud. That is not the German way. Reach for your spade and work yourself out of the wet and nearer to the enemy.

The Lord helps him who helps himself!

Varied Ground

Lewis Gun in Trench Battles

The British Intelligence Office recently made public an article captioned "The Lewis Gunners," in which the writer, the commander of a Lewis machine-gun detachment in France, described the important part that the machine gunners play in the great war. The article reads:

Important as are the grenadiers—and it was one of the causes of the failure at Loos in September-November, 1915, that we were neither so well supplied with bombs as the Germans nor so technically proficient in their use—yet the true infantry missile, the bullet, is far from being displaced. It is more important than ever, and the greatest efforts are made in all armies to increase to the utmost possible extent the volume and control of rifle-caliber fire. The weapon which gives to the soldier the opportunity of effecting this increase is the machine gun, in one or other of its forms.

Now, in this matter of machine guns, their tactics and their types, if not in the number of weapons employed, the new British Army has undoubtedly proved itself superior to the Germans. Machine guns are of two distinct patterns—the gun that is fired from a fixed platform or tripod, and the gun that can be fired from the shoulder and carried like a rifle. The German Army knows only one type, the first. The British Army possesses both, and differentiates sharply in their use. The fixed-mounting type is the Vickers, and that is the weapon of the companies of the machine-gun corps. The hand-wielded weapon is the Lewis gun, and that is the arm of a specially trained infantryman, who is, however, not necessarily a machine gunner.

The necessity of maintaining a formation of small groups on the modern battlefield and the equally strong necessity of keeping control of those groups have made the platoon the tactical unit of the infantry. Each platoon is commanded by an officer, with four other ranks for messages, etc. The platoon of assault is divided into four sections, each containing one noncommissioned officer and eight other ranks, viz., a section of bombers, a section of rifle bombers, a section of riflemen, a section of Lewis gunners. In a battalion there are ten Lewis guns with an officer specially in charge. These guns are distributed among platoons as above indicated, with a variable number held in battalion reserve. Not all the platoons of a battalion have Lewis guns.

Let us follow the work of the Lewis gunners in a great attack, such as those made recently on the western front. Before the zero hour when the "creeping barrage" of the artillery will begin to cover the advance of the infantrymen, the Lewis gunners steal out into the tangled, shell-plowed desolation of No Man's Land. In front of them is the irregular line of the enemy's parapet, and cunningly hidden along that parapet, and perhaps in front of it, are the enemy's machine guns in emplacements protected from direct fire, waiting to emit streams of bullets diagonally across the attack. As far as possible those machine guns have been located, and the task of the Lewis gunners crawling forward in that thrilling night which precedes the assault is to knock them out at the critical moment. Fumbling over the obstructions in the darkness, tearing themselves free from the clinging wire, throwing themselves flat among the unburied dead of earlier fights when the enemy flares soar up, they make their way to their appointed shell holes, where they will lurk until the supreme moment. It arrives. The monotonous rush upon rush of desultorily arriving shells which pass and burst in the enemy's lines leaps suddenly to a whirlwind of crashing, riving

noise. The Lewis gunners lift their weapon to the rim of their shell hole. The horizontally placed disk of cartridges is in position. The arquebus-like barrel in its radiator casing points to the target, the butt is firmly pressed against the marksman's shoulder, his fingers close upon the trigger and a rapid stream of bullets goes hammering into the hostile emplacement which is his objective. Other Lewis guns in other shell holes are sweeping the top of the hostile parapet so that no enemy dares show his head.

The artillery barrage lifts and shows again a little further on. Behind the Lewis gunners in their shell hole is a murmur of voices, shouts faintly heard in the deafening din of bursting shells. The infantry is going "over the top." They pass at their best walking pace—to run is impossible on this shell-softened ground—stream toward the enemy's lines. They swarm over the parapet amid the crackling of machine guns and the thudding of bombs.

The Lewis gunners have their task precisely set. Their chief function is to facilitate the progress of the leading wave, and they advance with it. If the general orders are that the leading wave shall press straight to a further objective, leaving trenches in rear to be cleaned up by following waves, then on the flanks of those following waves Lewis guns are also posted. They assist the "mopping up" parties in cleaning out the groups of the enemy who have concealed themselves during the first rush, keep down the heads of hostile bombers, and stalk and annihilate machine-gun posts. If a portion of the line frays out under the enemy's fire during the advance and leaves a gap, it is the Lewis guns from the battalion reserve which fill that gap. If the advance is checked by an enemy strong point—*"ilots de resistance,"* as the French call them—the fourfold functions of the specialized platoon come into play. The Lewis gunners and the rifle bombers work round the flanks of the strong point (generally a trench crossroads), and open a hurricane of fire. Under cover of this the bombers and the riflemen storm the enemy. The Lewis guns back up the patrols which go forward to exploit the temporary demoralization of the enemy, and, while the infantry, which has arrived at its objective, is energetically consolidating the trench to be held, they are dotted along the outpost line which protects that infantry. The trench line ready for defense, they are withdrawn to it and form a very valuable part of the garrison which will by its own fire-power have to check the reaction of the enemy.

Should the enemy's counter-attack be so far successful that the advanced line cannot be held, it is again the Lewis gunners who remain until the last and, with their relatively great fire-power, cover the retreat of their comrades.—

The Infantryman's Main Arm—Rifle Fire in War

The multiplication of weapons of offense, such as bombs, rifle grenades, trench mortars, machine guns, gas and liquid fire, and the actual assault on trenches have tended to obscure the value of the rifle as the infantry soldier's main arm. It is sometimes spoken of, by those not acquainted with conditions at the front, as if it were merely a handle for the bayonet and as if, as a firearm, it were comparatively useless, except for snipers and specially selected shots. This is by no means the case, and it would be very unfortunate if such an impression got abroad. Only yesterday the special correspondent of *The Times* spoke of the preeminent importance of rifle fire in recent fighting and of the soundness "beyond everything else" of musketry as a tradition of the British Army.

In the early stages of the war, when the Germans had an immense superiority over us in artillery, the rifle fire of the British infantryman, more than

any other single cause, saved the British Expeditionary Force from annihilation. Outnumbered as it was in all the early engagements of the war, it would have been overwhelmed and almost wiped out had it not been for the infantryman's wonderful shooting. At Mons, Le Cateau and elsewhere the Germans ventured to approach our trenches in massed formation. They reckoned, it is said, on losing most of their first line from our rapid fire and possibly the second, but with the third they expected to come in. But they had not reckoned with the British soldier's "fifteen rounds a minute." In consequence, when the Germans came up in their compact masses the British soldiers found them such an easy target as they had never experienced on the range. With no perceptible pause for reloading their magazines, as an observer noted, the pitiless fire went on from the men lining the trenches, until finally the thick masses broke and withered away. And so it was in all the early battles. A German officer, an expert in musketry, described our shooting in these early days of the war as marvelous. The Germans, he added, had counted on being able to rush us by weight of numbers, and found themselves quite unable to do it, because our fire was "so straight and so quick."

Such mastery of the rifle as these men possessed could not be expected from the new armies and the new drafts, whose training had to be completed sometimes in less months than the old army had years of soldiering. Nevertheless, by a careful selection of points to be insisted on in training and still more by copious practice with live rounds at the ranges, the standard of musketry in the British Army has been consistently maintained at a high level.

Recruits have to be practiced in picking up objects at which to aim on miniature targets and at 30-yard ranges in the open, where the varying conditions of light and distance and the multiplicity of objects can be demonstrated practically by the instructors. By such methods the recruits of today are being trained for the actual conditions of warfare. The old fifteen well-aimed rounds a minute is, no doubt, unattainable now, but ten or even twelve a minute is a by no means rare accomplishment in our new battalions; whereas the best-trained German regiments before the war did not exceed an average of eight or nine rounds a minute.

The Essential Instrument.—How far, it may be asked, is this power of rapid firing utilized in the present war? When it comes to active attack or defense, the rifle as a fire-weapon is still, in spite of guns, bombs, mortars, and machine guns, an essential instrument of victory. Other weapons have their uses in greatly facilitating the attack, but success in the main is due to the personal factor of the infantryman carrying out the charge. The importance attached to the rifle for his work is obvious from the fact that he carries 170 rounds on his person in the assault. If the infantryman had nothing to rely upon but his bayonet or the few bombs he carries, our successes would not have been what they were on the Somme, at the Vimy Ridge, and at Messines and Wytschaete. But he has his rifle and has often to use it in that perilous journey. For the successful use of fire tactics in the advance through a bullet-swept zone the officers must have a complete control of their men and be quick to grasp the situation, while the men must have had a thorough training in the use of the rifle. The fact is that,

in spite of new weapons and, in some respects, new methods of warfare, the old regulations for training in the use of the rifle and for its use in the attack are in principle as sound as ever.

In the defense of a trench against an assaulting party the rifle is equally the best weapon. Bombs and trench mortars are of comparatively little use against attackers rushing forward in the open. Shrapnel, if it can be brought to bear quickly enough, may be useful, but it cannot take the place of rifle fire from the trenches. This can be brought to bear at once, and each round can be aimed with deadly effect. Hence a cool line of riflemen in the trenches still provides the most effective method of picking off the assailants as they advance. Machine guns are, of course, useful for the same purpose, but, even with their vastly increased numbers, they are unable always to sweep the whole line of advance. As long as the infantryman has confidence in himself and his rifle and has plenty of ammunition he remains the real master of the situation. The same applies to the defense of a captured trench, which has at once to be strengthened against counter-attack. The ends leading into the enemy's communication trenches are barricaded, and bombers and riflemen are posted to resist an advance. New reverse parapets are hastily dug, and the diggers are guarded by riflemen posted to pick off any enemies seen advancing. Once more, until the next wave leaps forth to a further trench, the rifle is chiefly used for defense of the newly acquired trench.

Besides, the trench warfare of the western front is not the only form of battle for which the British soldier must be trained. Throughout this war, even on the west, we have consistently kept before our eyes the possibility of more open warfare, when bombs will be useless and the day must be won by the rifleman's advance and fire mastery of his opponents. On other fronts this is already the case. Constant exercise, therefore, in fire practice with the rifle, as is insisted on in courses of instruction both at home and in France, is essential. The infantryman must learn to rely on his rifle as his own *ultima ratio*. In fact, to use the words of a recent army memorandum, "It is the spirit of the bayonet that takes a position and the bullet which holds it. The bullet shatters the counter-attack and kills outside bayonet distance." And, finally, "The bullet is the paramount executioner for offense and defense.—*The Times*, London, August 8, 1917.

The German Assault Battalions and Shock Troops

The *Kolnische Volkszeitung* described lately the training, preparation and method of employment of the selected German assault battalions and shock troops.

They are quartered at a certain distance from the front, in their own training camps, where they are carefully practiced in the kinds of duty they are expected to perform. They learn how to attack over ground torn up by the explosion of shells and of mines, how to get through obstacles, how to use bomb-throwers of various types, and how to throw them by hand. A witness of their drills is astonished at the quickness and dexterity with which these troops and their commanders know how to utilize shelter, avoid obstacles, and employ bombs.

The so-called "Shock troops" prepare, finish and increase the effect of

assaults delivered by companies or by entire battalions. They are small detachments formed of a small number of squads. Each man in them is chosen with care and trained specifically for the duty assigned him.

In principle these troops are ordered to drive the enemy, on a certain definite and small portion of the field of battle, from certain important advanced points, to open a way through obstacles, to ascertain the disposition of the enemy's force—in short they are charged with one of the missions which require non-commissioned officers and soldiers who are brave, adroit and enduring.

Equipped with gas masks, supplied with many hand grenades, and followed by bearers carrying many more, the soldiers of these groups move forward in open order and throw themselves in the craters formed by mines and shell. They advance by rushes to the obstacles in front of the enemy. Where they cannot get through they use cutters and explosives. If the trench is still held they drive out the occupants with bombs; then they take up a position on the flank of the enemy.

A few good soldiers can accomplish an extraordinary task. When serious work is in hand, when it is proposed to prepare for an attack by assault companies or larger assault units, a number of shock detachments work together. The execution of these enterprises is preceded by a rain of bombs from small bomb-throwers. Flame projectors are also used. In short, any technical method is employed which can open the road for the small shock detachments and insure their success.

Aeroplanes Next

Everything nowadays progresses or is transformed with a rapidity utterly unknown to our fathers. The period of steam, of electricity, of aviation, has taken the place of the period of stage coaches, and new developments of ideas, like new developments in things, have advanced as much in ten years as they formerly did in a century or two. The tactics of combat subject to evolution, like everything else, have not escaped from the action of the general law.

When Napoleon said that they ought to be changed every ten years he thought that he was going very fast. What do we see now?

Since the modifications forced upon the tactics of combat by the war of 1870 changes have been continual, forced by the increase in armament and in effectives which Prussian militarism has inflicted upon the world. On one side the progressive increase in the number of soldiers, on another the increased rapidity of loading firearms, the increase in their range, the improvement in their projectiles, the new uses of explosives, the employment of railroads, the linking up of units by the telephone and telegraph, the military application of every new scientific discovery at the moment it is made—each of these at any moment forced a change.

During the life of the emperor, armament did not make a single step in advance, which is a strange enough thing in that essentially military reign. The old flint-lock musket of 1777 and the guns of the Gribeauval system of 1765 were the working tools of the great epoch; the first survived it until 1840 and the others until 1827. If the tactics of the great army of Austerlitz were not those of the little army of Italy in 1796, and if the battle of nations at Leipzig did not in the least resemble that of Jena, the nature of the armament employed had nothing to do with

the differences. The changes were produced only by the adoption and development of the "war of masses."

In the past eighty-five years, on the other hand, armaments have gone through radical and incessant changes, while the system of "the nation in arms" taking the place of the professional army has been pushed to its ultimate consequences. These have had their logical effects upon tactics. Accordingly from 1870 to 1914 our infantry regulations have been made over nine times. The last appeared at the very eve of the war on April 20, 1914. In going over this series of regulations one cannot but be impressed by the want of order in the ideas which inspired them; the influence of the latest fashionable theory which is shown from one edition to another, but in all his work of Penelope one finds too little—to avoid saying no use at all—use made of the lessons given by contemporary campaigns. The great lessons of the Turkish-Russian War of 1877-78, those of the Boer War, and those of Manchuria have left no traces. If they have not been heard of by us, at least they have not been studied and understood.

We saw it only too soon in August, 1914, by the terrible surprise we had on meeting upon the field of battle an armament and methods of combat which our enemies alone had succeeded in basing upon those experiences. We found ourself in front of new tactical methods which we had not foreseen. The reasons for its development had escaped us.

In the midst of the war it still develops. But now we have eyes to see and recognize the changes, and we are able to follow them. We are already in the midst of the fourth change since the beginning of hostilities.

After scarcely six weeks of war of maneuver a new type of war appeared. It was trench warfare, and not that of today, but the first type of trench war. During that period we both fought with the same arms with which we began the campaign, our enemy having, however, the advantage over us of heavy guns and of means of auxiliary defense.

Then a new form of war appeared. Siege warfare with its tools, its special arms and methods began in the open field. The armament of the infantry soldier is completely changed. That of the artilleryman is increased in power and range. The trenches were now modeled on the parallels with which one advanced upon a fortress.

That sort of war raged for thirty months and might still rage and long continue to do so, for the trench and the gun were so nearly equally matched.

But its character changes. Since the trench proved to be elastic, since it could not be pierced, since its flanks could not be gotten at, nothing was left but to pass over it to strike and demolish personnel and matériel behind it. The aeroplane was next.

The importance of this weapon grew from day to day, not only in the preparation of attacks but in their execution. It is easy to remember the services the British squadrons gave during the period immediately preceding the assault on the crest of Vimy. The affair took place on April 9. During the night of April 5-6 they dropped 8 or 9 tons of bombs and brought down some fifty German aeroplanes; during the battle itself, flying low, they continued to blind the enemy and to break up his reinforcements. On the other hand, our offensive of April 16 in Champagne did not give the results we hoped for. The principal reason was—everyone knows it now—that our craft were not

up to the mark, partly on account of bad weather and partly on account of mistakes made in using them.

The prelude of the offensive in Flanders which has just begun was a long air battle lasting from July 7 to July 20. During this battle 118 German aeroplanes were brought down, 110 were forced to land in a damaged condition, while the British lost in all only 83.

The future of the tactics of combat is in the air. The British have grasped it. The Americans are just as convinced of it. They have begun by devoting $600,000,000 to aviation.

Is not France tired of hesitating in this matter? Are we not going to decide upon the steady effort which is required?

Yesterday we were crying out, "Give us guns; give us ammunition." Now we must call out, "Aeroplanes, aeroplanes, and more aeroplanes!"—General Fonville in *La France Militaire*, Paris, August, 1917.

Military Training of Youth in England

Throughout England special battalions of young men, all under the age of 18 years and 8 months, are now in training for the Army. In order that these lads may not be broken in training, a special syllabus has been prepared and issued to the commanding officers of these young battalions. It is intended that this should indicate the maximum of work required to be done by the young Class A recruit. Commanding officers may, if the weather is trying or the lads are not equal to the course, modify the training, and many, it is understood, do this at their own discretion.

By comparison with the syllabus issued for the training of full-grown recruits the 18-year-olds' course is moderate. It allows time for a graduated instruction in physical drill and preliminary hardening of muscles. It recognizes the fact that the boys require organized games, lectures, and education in many matters besides the right way to use a bayonet or dig a trench.

The training course is divided into twelve fortnightly periods. During the first fortnight sixty-four hours of work are expected. Twelve hours of this time are given to organized games and education. In subsequent periods fourteen hours are set aside for the same purpose.

Value of Boxing

The value of manly games in training has for some years been recognized in the training manuals, and it is a welcome sign of the times that the Army Council so emphasizes the moral and physical value of boxing, football, and cricket as an aid to the training of the young recruit. All must take part in them, and commanding officers are specially required to avoid the temptation to form one or two high-class teams at the expense of the rest of the battalion.

In the fourth fortnight of training when the troubles of inoculation, vaccination, and dentistry have been overcome, the battalion falls into a settled routine involving eighty-four hours' work per fortnight for the recruit, the youngest of whom is then over 18 years and 2 months old. He now divides his time as follows:

	Hours.
Physical training	10
Running training	10
Bayonet training	6
Squad drill	18
Musketry and miniature range practice	18

	Hours
Interior economy	2
Night work	3
Guards	3
Anti-gas	2
Bombing	3
Route marching (without packs)	3
Special lectures	2
Games and education	14
	84

"Interior economy" includes such essential matter as kit inspection, care of equipment, and fitting of clothes. Lectures include plain talks on discipline, hygiene, sanitation, *esprit de corps*, first aid and casualties, and, later on, trench warfare, concealment, cooperation with artillery, and aircraft.

Education Courses

Education hours provide not only for the teaching of the 3 R's to those lads who had not benefited by their school days, but in addition gives to all the better educated interesting instruction in subjects which are likely to be of value from a military and imperial point of view.

A wise provision of the course for the young recruit requires that there shall be no route marching with packs during the first fourteen weeks; this prevents the risk of lads being knocked up by carrying an unaccustomed weight before they are fit to do so.

In the fourth fortnight running training begins and three hours of the fortnight are given to route marching. Bombing with dummy bombs is also practiced. In the fifth, the first part of the general musketry course is fired, field engineering begins, and the young recruit feels that he is becoming a useful soldier. Ceremonial drill does not form part of the training until the tenth fortnight.

Commanding officers are asked to pay special attention to the men who show an aptitude for command with a view to training them as noncommissioned officers.

The above syllabus is drawn up for the Class A man. For men of the lower categories modified instructions are issued, and a system is now in force which gives youths and men of poor physique a six-weeks trial of simple exercises before their future as soldiers is finally decided.—London *Daily Mail*, June, 1917.

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Editorial Department

After the War, What!

Although the war in which we are engaged will hardly end tomorrow, we shall certainly wake up some morning to find that an armistice has been signed and that commissioners are on their way to some meeting place. It is, of course, possible that they will devise some method of securing an enduring peace in which the great guns now roaring in Flanders will cease their thunder and be melted down, and the remaining bombs and gas masks will find permanent resting places on the more dusty and inaccessible shelves of museums. It is, of course, possible, but then many men have foreseen these desirable things at the end of many wars, and yet here we are engaged in the greatest of all wars.

What is the Army of the United States going to be when this war is over? Are we going to again believe that never again will a war be possible, or at least one not of our own choosing? When the treaty of peace is signed we shall have accumulated a great mass of expensive matériel and a trained or partly trained personnel. What are we going to do with it? Of course, we cannot make absolute and complete plans now, but we can prepare tentative ones; we can come to certain decisions which will enormously simplify the difficulties, not so much of demobilization but of preparing for the peace status of the forces of the United States.

It is a fair assumption that those forces in some form will continue to exist. Unless we ignore the past we must admit that it is probable that somewhere, at some time, they will be again required. It is also fair to assume that when that time comes we shall not have armed friends to hold our enemy down while we go into training to fight.

Shall the forces of the United States be organized primarily to defend the territorial integrity of the nation, or shall they be organized primarily to carry war abroad? Shall the basic principles of Switzerland or of Prussia be adopted, and how many men will be required? If we are to have universal service, how shall we best profit from what we have so far done? Certainly to avoid loss of knowledge and of the matériel we are acquiring there should be no interregnum in passing to a peace status. To do it we must know what the peace status will probably be. We shall not be able to hold men under arms while we discuss it.

One thing we cannot do. We cannot go back to the status before the war. We cannot go back if we would. Even if we want to stand still, we shall find that the world current still bears us on, as it has swept us into this war.

¶

A Trade Journal.

A magazine is like a reservoir in that it has to be kept filled, and it rarely happens that one stream will serve, for there is always a chance that it will dry up, in which case the conduits dependent upon the reservoir go dry also. A new editor feels this when he looks over the material available for the next issue, an issue which has to go to press, and the press is an inexorable sort of machine. Copy has to be ready on the appointed day.

The INFANTRY JOURNAL has filled

several purposes in its life. At one time it was chiefly concerned in explaining that the Infantry really existed. That period has passed. There is now a great deal of infantry, either completing or beginning its education, and its JOURNAL may well take on a new duty, or at least one which was not completely understood when it was established. Then the education of the Infantry of the Army of the United States was rather a process of absorption of knowledge than of conscious training at high pressure. Life went on very well in those comfortable days when any captain would have shied at a company of two hundred men, however competent he, of course, was to command an army corps. Now we have the companies and we have divisions, even though they are in the process of being created. The men who form them are largely men who in their normal lives read trade journals, journals on engineering, on accounting, on salesmanship, and the rest of the manifold activities of life.

One of the most valuable functions of these journals is that they are mediums for the exchange of experience. It is quite probable that the articles in them which are most valued are those in which the writers describe how they overcome obstacles which rose before them in carrying on their occupation or their trades.

Learning to be a soldier is learning a trade, whether it be to command a regiment, a company, or a squad, or the duties of a member of the squad. The pressure of the moment does not give much time for this education, and yet upon its thoroughness may well depend not merely our own lives but the lives of the men we lead and the honor of the United States.

Consider the INFANTRY JOURNAL as the trade journal of the United States Infantry. It will be read in every one of the concentration camps where new men are struggling with new problems, not merely in training but in the conduct of life, for war is not merely fighting—it is a certain kind of life to be lived with its limitations and restrictons, which are hard and rigid ones with a rigidity whose constraint and not utility is felt by a man subject to it for the first time. At every one of these camps different methods will develop for obtaining the essential results which have been set forth in the instructions of the War Department. They will all work if they are continued with, but it is obvious that some will be better than others. The INFANTRY JOURNAL could well serve as a medium for exchange and comparison of methods.

To submit them will require no great amount of time and labor. A new scheme for keeping the dust out of the breechblock of a machine gun, a method of expeditiously disposing of the garbage from the company kitchen, a device for controlling the waste of water from the shower baths, have all become of interest and which, to the man concerned, loom for the moment quite as large as the best way of taking cover or throwing bombs. At every one of these camps men today are solving such problems, and as these men all now form part of the forces of the United States it is well that a solution which is found satisfactory in one place should be known elsewhere.

It is a matter of teamwork, of cooperation, and it would seem that the colums of the INFANTRY JOURNAL could materially aid in the exchange of the knowledge of methods and of appliances which are being evolved under the

pressure of the intensive training which is now going on.

Accordingly, while men who are very busy will hardly read a long and doubtless valuable article upon the mistakes of Napoleon, they will yet be glad to hear how someone in the next regiment or in some other camp has mastered the difficulties which are perplexing them.

To convey this information it is not necessary to write an article. A short description of the method found advantageous will be quite enough, and if such material is sent to the JOURNAL it can be combined with similar matter in such a way as to help others who, after all, are working for the same ends and under the same limitations.

"Confidential"

What is "confidential?" Not only what is "confidential" but how confidential is it? Does it mean that you only tell your best friend and your wife or do you also take in your first lieutenant and your first sergeant? Would it not be well in the manuals which the Adjutant General's Office is distributing to drop the word "confidential" and in place of it print "distributed, includin Captains," "distributed, including Majors Field Artillery," or "distributed to all Officers of the General Staff," or something of that kind?

This would probably limit conversation upon the subjects comprised, and, at least, would at once answer the question: "How confidential is it?"

Learning French

In learning a foreign language, a vocabulary is the most important thing. You can get along with rather little grammar if you know words and are not shy about using them. Of course, the net result is not the language as it should be spoken, but most men who find themselves in France will be more concerned in learning their way to their camp or in finding out where such simple amusements as are obtainable in the vicinity are to be found than they are in carrying on a polite conversation with due consideration for the subjunctive mode.

To acquire a vocabulary it is a good plan to carry about one of the small French dictionaries or word-books, and when you see or think of something whose name you do not know in that language look it up then and there. For example, you see a saddle; you do not know what "saddle" is in French; you look in the dictionary and find "selle." When you see the saddle and find out the word for it at the same time, the French impresses itself on your memory in a way which it does not do when you attempt to learn merely a list of words without connecting them with the things they stand for.

This method can be used in otherwise idle hours. It is particularly good in traveling, and in applying it little by little a working vocabulary is picked up in a short time. After all, one can get along with a few hundred words if they are limited to the subjects with which you are directly concerned, and when to the vacabulary you have added the rules for expressing plurals and the more usual tenses of verbs, you will find yourself beginning to use a language which is at least understood. Of course it is not good French. Perhaps it is not French at all, but it will take you where you want to go, and that is what you are really concerned with.

Night Operations

A Department devoted to the interest of newly commissioned Infantry Officers, Officers of the Infantry Officers' Reserve Corps, and candidates for Commission.

Conducted by Captain W. H. Waldron, 29th Infantry

SMALL ARMS FIRING REGULATIONS

Q. What rules govern the sequence to be followed in the conduct of target practice?

A. The practice season opens with instruction practice, qualification course. This is carried to completion for each soldier before he proceeds to record practice. When the instruction practice, qualification course, is completed, the soldier proceeds to record practice (same course) and follows this to completion.

No individual will fire record practice, qualification course, on the same day as any part of instruction practice. Record practice having begun for any individual will be finished before any other firing is taken up.

While record practice is being conducted at any distance, there will be no other firing on the range at that distance.

A record practice score for any individual once begun at a range will be carried to completion at the range without interruption.

Q. What limitations are placed on the use of sighting shots?

A. Sighting shots form no part of the score and are not recorded as such. When sighting shots are prescribed they must be taken. If, through no fault of his own, a soldier's record score is not completed at a range where sighting shots are prescribed and has to be repeated, he must be given sighting shots with the new score.

Q. Describe the method of scoring at target practice?

A. The record of the score, from which classification will be made, will be kept at each firing point by a noncommissioned officer, who will be assigned, unless at a one-company post, to a point where his own company is not firing. The scoring will be closely supervised and the record verified by a company officer. Scores will be recorded on the range with pencil on sheets prepared for that purpose.

A separate sheet will be kept for each man firing, and as soon as the man's score at any range is completed the scorer will sign the sheet and the company commander will take it up, initial it, and keep it in his personal possession until the soldier is again called upon to fire. The record scores will be transferred from these sheets to the company target record by the company commander. The company target record will be kept in the personal possession of the company commander and not allowed in the hands of an enlisted man from the beginning of record practice until the required reports for range practice have been rendered. All entries in the company target record will be made in ink and no corrections or alterations will be made except by the company commander, who will initial each correction.

Q. What are the rules prescribed for scoring slow fire?

A. The scorer, as each shot is signaled, will announce in a tone loud enough to be heard by the firer the name of the firer and the value of the hit, and will record it on a sheet assigned to that soldier.

A shot upon the wrong target will be entered upon the score of the man firing as a miss, no matter what the value of the hit upon the wrong target.

If two shots strike a target at the same or nearly the same time, both will be signaled: and if a shot was just fired from the firing points assigned to that target, the hit having the higher value of the two will be entered in the score of the soldier firing from that target point and no record made of the other hit.

Q. What are the rules prescribed for scoring rapid fire?

A. In rapid fire as each shot is signaled it is announced as follows: One five, two fives, three fives, one four, two fours, three fours, four fours, one three, one miss, two misses, and jotted down on a pad as called, the scorer watching the target as he calls the shot. After the marking is finished the scorer counts the number of shots marked, and if more or less than 10, calls: "Re-mark No. —." If 10 shots have been marked, he then enters the score on the soldier's score card and totals it as follows:

5 5 5 4 4 4 4 3 0 0 = 34

In record practice, in case of two men firing on the same target, the resulting score will be rejected, the soldier at fault being credited with only such hits, if any, as he may have made on his own target, the other soldier repeating his score. In case of more than 10 hits on a target, the score will not be recorded and the soldier assigned to that target will repeat the score.

Q. What are the general rules to be observed in marking targets?

A. When a post is garrisoned by a single company and it is impossible to detail noncommissioned officers of other companies to supervise the marking and scoring, those duties will be performed by the noncommissioned officers of the firing company. In record firing, qualification course, when only one company is firing, new paper targets will be used for each day's firing, and upon its completion the company commander or one of his lieutenants will count the number of hits made in each division of the target and compare the totals with the recorded scores.

As in some cases the markers may inadvertently make errors in signaling hits, whenever an examination of the target gives results very closely agreeing with the recorded scores, the record should be permitted to stand, but the markers cautioned to exercise greater care in the future.

Any shot cutting the edge of the figure or bull's-eye will be signaled and recorded as a hit in the figure or bull's-eye, and as the limiting line of each division of the target is the outer edge of the line separating it from the exterior division, whenever this line is touched by a shot it will be signaled and recorded as a hit in the higher division.

In record firing the officers in the pit will verify every miss before it is signaled, and will closely observe the marking on the targets to which they are assigned to prevent fraud or errors on the part of the markers.

Q. What are the rules prescribed for marking slow fire?

A. In slow fire with the rifle, as each shot is fired the noncommissioned officer indicates to one of the markers the value and position of the hit, if any is made, and supervises this marker while he signals the result of the shot to the firing point. The center of the disk should be placed over the shot hole. When double sliding targets are used the target hit will be withdrawn and the location of the hit indicated with the proper disk on the other target. After the result of the shot has been signaled, if a direct or ricochet hit has been made, the other marker will cover the shot hole with the proper paster. When spotters are used the shot hole will not be pasted up, but the spotter hung in the hole. When the exposed target is hit it is withdrawn and the other target run up, the spotter showing the exact location of the preceding hit on that target. When another hit is made on that target it is withdrawn, the spotter changed from the first shot hole to the second, and the first shot hole pasted up. When spotters are used care must be taken to paste up a shot hole as soon as the spotter is removed and also to paste up any shot hole in the spotter itself.

The value of a shot will be indicated to the firing point as follows:

If a bull's-eye, with a white disk.

If a center (four), with a red disk.

If an inner (three), with a black and white disk.

If an outer (two), with a black disk.

With spotters, two disks may be used, fixed in sockets on the top of the para-

pet so that they may be seen from the firing point. One disk is white on one side and red on the other; the other disk a black cross on a white field on one side and all black on the other. When a hit is made its value is indicated by turning the proper face towards the firer, exposing it a few seconds, and then turning its edge towards the firer. When not indicating the value of hits, disks should be kept edge towards the firing point.

In marking targets the following will govern:

If ricochet, by displaying a ricochet flag: and if the target is hit, by placing over the shot hole at the same time the appropriate disk. The ricochet flag has a white field with a red center, similar to the flag used in signaling, the size depending on the distance.

If a miss, by waving the danger flag across the front of the target. If the markers know on which side of the target a miss is made, the flag will also be held on that side, but this should not be done unless the marker is absolutely certain on which side the miss is made, as false information regarding misses will so mislead the firer that he is likely to continue to miss the target.

If a hit is in the parapet, the flag will be so held as to give the necessary indication.

If two shots strike a target at about the same time, both will be signaled.

Q. What are the rules prescribed for marking rapid fire?

A. In this class of fire the time is regulated in the pit. The targets being ready, they are pulled fully down and a red flag is displayed at the center target. On signal from the firing line, the flag is waved and lowered and five seconds thereafter the targets are run up, being fully exposed for the time required for that range.

At the expiration of the time limit the targets are run down and the hits are marked, beginning with the highest in value, the disk being placed over the shot hole, then swung off the target and back to the next shot hole, care being taken to mark slowly enough to avoid confusing the scorer. The misses will be indicated by slowly waving the red flag once across the face of the target for each miss. The shot holes are then pasted and the target made ready for further firing.

During record practice the officer in charge of each pair of targets will keep a record showing the actual hits made on each of his targets in each score. At the end of the day's firing, or oftener if required by the officer in charge of the firing, this record will be turned over to the company firing at that target and compared with the record kept at the firing point, in order to determine if the hits recorded at the firing point agree with the hits recorded in the pit. In case the records differ greatly, they may be fired over, at the discretion of the officer in charge of the firing.

Q. What is the procedure prescribed for the firing of rapid fire?

A. At 200 yards there will be but one man firing at each target. The officer in charge of the line will command "LOAD!" The magazine will be filled, the piece loaded with one cartridge therefrom, and the safety lock turned to "Safe." When all is ready in the pit, the targets to be fired upon will be drawn fully down (the rear targets being blank or targets of another class than those being fired upon), and a red flag hoisted at the center target. When the red flag is displayed, the officer in charge of the firing line will command "READY!" when the safety lock will be turned to the ready and the position of "Ready" standing assumed, with the sling, if used, on the arm. The officer in charge of the firing line will then call so that all may hear, "Ready on the right; ready on the left." When the officer in charge calls out "Ready on the right," etc., anyone who is not ready must call out, "Not ready on target ——." If any soldier fails to call, it will be assumed that he is ready, and if he fails to fire when the target appears he will be given a total miss for that score.

The firing line being ready, the pit is signaled or telephoned, "Ready on the

firing line." When this signal is received in the pit, the red flag is waved and lowered and five seconds thereafter the targets appear, remaining in sight one minute and then disappear. The soldier, without coming to the "Order," takes the kneeling position as soon as any part of the target appears, begins to fire and attempts to fire 10 shots, reloading with a full clip which is taken from the belt, and continues to fire until 10 shots are fired or until the target disappears.

Each unfired cartridge counts a miss.

In case of a defective cartridge or a disabled piece, or when more than 10 hits are made on a target, the practice is repeated.

At 300 yards the procedure is the same, except that the soldier assumes the prone position as soon as any part of the target appears, the time limit being 1 minute and 10 seconds.

At 500 yards the procedure is the same, except that the soldier is in the prone position, with the piece at the shoulder, before the target appears, the time limit being 1 minute and 20 seconds.

At all ranges, in rapid fire, firing is from a full clip, and the second clip must be loaded from the belt. In case a clip jams or breaks, cartridges may be loaded singly.

At the expiration of the time limit the target is pulled down and marked, all hits being given their proper value. In case of more than 10 hits on a target, the target will not be marked, but the firing line will be notified and the firing on that target repeated. In case a soldier fires on the wrong target, only such shots as he may have fired on his own target will be counted on his score. He will be given misses for the remainder of his score.

In firing rapid fire, if more than one target is used, the first order of men at the firing point will fire together, one man at each target, all targets being fired upon at one time.

Q. What persons are required to fire the long-distance firing?

A. After an organization has completed record firing, qualification course, those men in the grades of expert and sharpshooter will take the long-distance practice.

Although the long-distance practice will be shot twice, but on different days, after an officer or enlisted man has once fired the complete long-distance course, practice at 800 yards may be omitted at the discretion of the company commander. The practice will be conducted as laid down for slow fire, qualification course. Every effort will be made to teach men the effect of wind, light, and temperature, and the value of small changes in elevation and windage at long ranges.

No report of this firing will be required, although a record of it will be kept in each company.

Q. What are the regulations regarding the firing with telescopic sights?

A. After long-distance practice has been completed, the four best enlisted shots of the company will fire, using telescopic sights. The ammunition used will not exceed 40 rounds per man firing.

This practice is intended for long ranges only, but it may be found necessary, until the rifles are accurately sighted and the elevations known, to start at shorter ranges and work back, no range being left until the target can be hit at that range. This part of the practice will be at the discretion of the officer conducting the firing. Target B may be used if found necessary to fire at ranges shorter than 1,000 yards.

At 1,000 yards each man will fire 20 shots for record. No report of the firing will be required, although a record of it will be kept in the company. This record will show the number of the rifle with which the score was made, the elevation and the windage used at the various ranges, and the force and direction of the wind at the time of firing. The data will then be available when further practice is held with this particular rifle and sight. Practice may be held at 1,200 yards where a suitable range is available.

This practice will not be held by Philippine Scouts.

Note.—The following is a summary of practice required for different grades of shots in known-distance firing:

(*a*) Recruits and those who in the last season of practice failed to qualify as marksmen or better will fire Tables 1 and 2 once through each, as prescribed, and Table 3 twice, as prescribed, before firing record. Additional instruction practice will be given all the men in this category, or to as many as may need it, in the discretion of the company commander, to the extent of the amount of ammunition that may be made available for this purpose.

(*b*) Men in the grade of marksman will fire through Tables 1 and 2 once each and Table 3 twice, and no more before firing record practice, omitting 5 shots prone at 200 yards (Table 1).

(*c*) Sharpshooters will fire in one season in instruction practice, qualification course, not exceeding 130 rounds of ammunition, at the discretion of the company commander, before firing record practice. Experts will fire for instruction not exceeding 100 rounds of ammunition, at the discretion of the company commander, and will not fire record practice.

(*d*) Soldiers of the grade of marksman or better who have been discharged and reenlisted will begin the new enlistment period with the course of firing prescribed for marksman, the restrictions for this grade as to the expenditure of ammunition holding good.

(*e*) All qualified experts and sharpshooters will fire twice through the course laid down in Table 6. But after an officer or enlisted man has once fired the complete long-distance course, practice at 800 yards may be omitted at the discretion of the company commander.

(*f*) The four (4) best enlisted shots of a company, selected by the company commander, will be given practice with telescopic sights, as prescribed.

Q. What are the details of Special Course A?

A. When Used.—When a complete range is not provided and a range of 200 and 300 yards is available, practice may be conducted, if authorized by the department commander, as prescribed in the following special course A. This practice is also prescribed for the Coast Artillery Corps and for bands in the Philippine Islands when required to fire. The instruction practice, special course A, will be followed for the supplementary firing for recruits and others who join too late to fire in the regular season.

Special course A shall consist of instruction and record practice as follows:

Instruction Practice.—Slow fire, target A; slow fire, target D; rapid fire, target D.

Record Practice.—Slow fire, target A; rapid fire, target D.

The details of this practice are as prescribed in the tables given below, which have the force of written regulations:

INSTRUCTION PRACTICE.

TABLE 1.—*Slow fire, target A.*

Range.	Time.	Shots.	Position.
200	No limit.	15	5 prone. 5 kneeling. 5 standing.
300	No limit.	10	5 prone. 5 sitting.

TABLE 2.—*Slow fire, target D.*

[Battle sight only will be used.]

Range.	Time.	Shots	Position.
200	No limit.	10	5 kneeling. 5 standing.
300	No limit.	10	5 prone. 5 sitting.

TABLE 3.—*Rapid fire, target D.*

[Battle sight only will be used.]

Range	Time.	Shots.	Position.
200	1 minute	10	Kneeling from standing.
300	1 minute 10 seconds.	10	Prone from standing.

RECORD PRACTICE.

TABLE 4.—*Slow fire, target A.*

Range.	Time.	Shots.	Position.
200	No limit.	10	5 kneeling. 5 standing.
300	No limit.	10	5 prone. 5 sitting.

Rapid fire as given in Table 3.

All practice in special course A will be conducted according to the rules prescribed for the firing at the same ranges in the instruction and record firing in the qualification course.

A special classification is provided for all those who fire special course A, as follows:

TABLE OF CLASSIFICATION, SPECIAL COURSE "A."

Grade.	*Points.*
Marksman	150
First-class man	120
Second-class man	100
Unqualified[1]	...

[1] All who fail to qualify as second-class men or better, and those who for any reason did not fire the course and are not otherwise classified.

Q. What are the principal things to be observed in firing at the shorter ranges?

A. 1. Setting the sight properly at the beginning of the score.
2. Aiming properly.
3. Squeezing the trigger.
4. Holding the rifle.

Q. What is the most important factor to be considered in long-range firing?

A. Wind is the most important factor to be considered in long-range firing.

Q. What effect has wind on the flight of the bullet?

A. The wind deflects the bullet from its course in the direction that the wind is blowing. The amount of this deflection varies with the force and direction of the wind.

Q. What is the rule for determining the amount of windage to be taken under varying conditions?

A. The wind gauge is graduated in points, and 1 point will move the bullet approximately 4 inches for each 100 yards of distance the firer is from the target and in the direction the movable base of the wind gauge is moved:

At 200 yards 1 point equals 8 inches.
At 600 yards 1 point equals 24 inches.
At 800 yards 1 point equals 32 inches.
At 1,000 yards 1 point equals 40 inches.

The amount of windage to be taken is determined by estimating the force and direction of the wind.

A simple rule for determining the approximate windage at any range is as follows:

$\frac{\text{Range} \times \text{Velocity}}{10}$ equals quarter points required for 3 or 9 o'clock winds. Winds one hour away from 3 and 9 o'clock require only slightly less windage. Winds one hour away from 12 or 6 o'clock require half as much windage as 3 or 9 o'clock winds.

Example: Range 800 yards: 5-mile wind blowing from 9 o'clock. $\frac{8 \times 5}{10}$ equals 4 quarter points, or 1 point of windage.

Q. What effect has the rise or fall of the temperature on the strike of the bullet?

A. A decided increase in temperature will cause the bullet to strike high; a decided decrease in temperature will cause the bullet to strike low.

Q. What effect has the heating of the rifle barrel on the strike of the bullet?

A. If the first shot has been fired from a clean, cool gun, the subsequent fouling and heating of the barrel and the difference vibrations of the latter, which are caused by the heating, will generally make necessary a slight increase in elevation for the second shot, and often an additional increase for the third shot. This should be followed in some cases where a number of shots are fired without cleaning or without any considerable interval by a slight lowering of the elevation after additional shots.

Q. What effect has light on the strike of a bullet?

A. Light.—Changes of light do not affect the flight of the bullet: they do affect the manner in which the aim is taken. As all men are not affected alike by changes of light, each man must determine for himself how changes of light affect him.

Using the peep sight, the bull's-eye of a bright target is more clearly defined than the bull's-eye of a dark one, and the firer will usually hold closer to the bright bull's-eye than to a dark one. If the target changes from bright to dark, the next shot will usually go low.

With the open sight, as the light changes from bright to dark and the rear notch fills with shadow, more front sight is seen, and the shot goes high.

If occasional shadows drift across the face of the target, do not fire until the target is bright.

In a permanent change of light, let the eye accustom itself to the change before firing. Then the aim will be the same as before and there will be no change in the position of the hit.

In rapid firing with open sights on very dark days shots seem to go high, due entirely to the firer taking more front sight than on bright days.

Q. What is mirage?

A. This is the term applied in target practice to heated air in motion, as seen through telescopes or field glasses on clear days with winds from 2 to 14 miles per hour. Through the telescope waves appear to be moving across the face of the target in the direction the wind is blowing.

Q. Upon what factors does success in rapid fire depend?

A. Success in rapid firing depends upon catching a quick and accurate aim, holding the piece firmly and evenly and in squeezing the trigger without a jerk.

Q. What practice in the manipulation of his piece must the soldier have to secure good results at rapid fire?

A. In order to give as much time as possible for aiming accurately, the soldier must practice taking position, loading with the clip, and working the bolt so that no time will be lost in these operations. With constant practice all these movements may be made quickly and without false motions.

When the bolt handle is raised it must be done with enough force to start the shell from the chamber; and when the bolt is pulled back it must be with sufficient force to throw the empty shell well away from the chamber, and far enough to engage the next cartridge.

In loading, use force enough to load each cartridge with one motion.

Q. What practice in aiming must the soldier have to secure good results in rapid fire?

A. The aim must be caught quickly, and once caught must be held, and the trigger squeezed steadily. Rapid firing, as far as holding the aim and squeezing the trigger are concerned, should be done with all the precision of slow fire. The gain in time should be in getting ready to fire, loading and working the bolt.

Q. What effects are produced by resting the rifle during firing?

A. In the ordinary positions for firing with piece supported by hands, arms, and shoulder, the explosion of the powder charges sets up in the barrel of the rifle certain vibrations which become disturbed and altered somewhat when the rifle is fired with the additional support of a solid rest applied at some point of the barrel.

Using the same elevations and aiming point the effect of a rest is exhibited in a changed point of strike of the bullet.

The vertical vibrations of the barrel are the more pronounced, and as these are interfered with by a point of rest under the barrel this species of support will usually change the point of strike more than in the case of a side rest against a vertical surface. In the latter case the piece is steadied rather than rested.

With a rest beneath the balance, or near that point, the tendency is to shoot above and to the right of the point of strike that would be attained without a rest, using the same elevation and point of aim.

The tendency is the same and more pronounced when the rest is under a point near the muzzle. The change in the point of strike in any case is slight and insufficient to carry the shot off the target from the center of target D at 600 yards.

In order that the shooting may be uniform, the piece should always be rested at the same point.

A side rest will cause no appreciable change in the point of strike.

In firing with the bayonet fixed, usually a lower point on the target will be struck corresponding to a reduction in the range of about 50 yards.

Q. What are the two classes of fouling found in the bore of the rifle after firing?

A. 1. A black deposit covering the entire bore, caused by the burning powder.

2. A metallic fouling caused by particles of the metal jacket of the bullet adhering to the barrel.

Note.—The powder fouling must be removed first. Then the metallic fouling can be seen in patches on the lands.

Q. How may the powder fouling be removed?

A. To remove the powder fouling use a cleaning rod long enough to clean from the breech; Hoppe's Powder Solvent No. 9; rags about 1¼ inches square, of thin flannel or any other soft material.

Q. How may the metallic fouling be removed?

A. To remove metallic fouling, use ammonia solution. This is made as follows: Take ammonia persulphate, 1 ounce; ammonium carbonate, 200 grains; ammonia (28 per cent), 6 ounces; water, 4 ounces. One rounded tablespoonful equals 1 ounce of persulphate or 200 grains of carbonate.

Powder the persulphate and carbonate separately. Dissolve persulphate in the ammonia and the carbonate in the water and then pour the mixture in a strong bottle, and cork. If mixed in this manner, it may be used in an hour.

To use.—After the barrel has been cleaned with No. 9 and wiped dry, cork up breech with a small cork, put a piece of rubber tubing about an inch long on the muzzle, and fill the barrel with the solution. It will boil up instantly with a white foam, very slightly blue. Let the solution stay in the barrel not more than 10 minutes and then pour out. If there was any metal fouling the solution will be dark blue.

Fill the barrel with water to remove any remaining ammonia, pour out and then remove the cork and rubber tube, wipe barrel perfectly dry, and then rub with oiled rag.

Care should be used in mixing and using this solution, for if improperly mixed or used it will injure the rifle. If the solution, after being used, is brown, it is bad and should be thrown away. The proportions of persulphate and carbonate should be the same in bulk. Too much persulphate will injure the barrel.

Keep the barrel filled. If the solution evaporates, it will leave a deposit of persulphate on the surface of the bore and will injure it.

An experienced noncommissioned officer should mix the solution and supervise its use.

Care should be taken not to spill the solution on the barrel or in the mechanism.

Q. Why are rifles always cleaned from the breech?

A. Rifles should always be cleaned from the breech, thus avoiding any possible injury to the muzzle. Any injury to the rifling at the muzzle will affect the shooting adversely. If the bore for 6 inches at the muzzle is perfect, a minor injury near the chamber will have little effect on the accuracy of the rifle.

Q. Describe the process of the daily cleaning of the rifle during target practice.

A. Take a couple of rags soaked in No. 9 and run them through the barrel until they have removed all the powder fouling; run clean rags through to dry the barrel; clean with ammonia solution as directed and finish by wiping out with a greased rag or a clean rag soaked in No. 9. For grease, use vaseline, cosmic, or "3 in 1" oil. After the barrel is cleaned, wipe out the chamber, the cam bolt, and all visible working parts. Occasionally clean out the magazine and wipe off magazine spring, then wipe all working parts with a greased rag.

After cleaning the working parts, wipe off the stock and outside of barrel with oiled rag.

Before firing again, wipe all oil out of barrel, but leave chamber and working parts slightly oily. This will prevent shells binding in chamber and will make parts work easier. Wipe all oil from outside of barrel and stock.

Note.—The following instructions regarding the loading and handling of the Colt's automatic pistol are considered of great importance to the Reserve Officer and are here inserted for his information.

Careless handling of the pistol is the cause of many accidents and results in broken parts of the mechanism. The following rules will, if followed, prevent much trouble of this character.

(*a*) On taking the pistol from the armrack or holster, take out the magazine and see that it is empty before replacing it; then draw back the slide and make sure that the piece is unloaded. Observe the same precaution after practice on the target range, and again before replacing the pistol in the holster or in the armrack. When taking the *revolver* from the armrack or holster and before returning it to the same, open the cylinder and eject any empty shells and cartridges. Before beginning a drill and upon arriving on the range observe the same precaution.

(*b*) Neither load nor cock the weapon until the moment of firing, nor until a run in the mounted course is started.

(*c*) Always keep the pistol or revolver in the position of "Raise pistol," except when it is pointed at the target. (The position of "Lower pistol" is authorized for mounted firing only.)

(*d*) Do not place the weapon on the ground where sand or earth can enter the bore or mechanism.

(*e*) Before loading the *pistol*, draw back the slide and look through the bore to see that it is free from obstruction. Before loading the *revolver*, open the cylinder and look through the bore to see that it is free from obstruction. When loading the *pistol* for target practice place 5 cartridges in the magazine and insert the magazine in the handle; draw back the slide and insert the first cartridge in the chamber and carefully lower the hammer fully down.

In loading the *revolver* place 5 cartridges in the cylinder and let the hammer down on the *empty chamber*.

(*f*) Whenever the pistol is being *loaded* or *unloaded*, the muzzle *must be kept up*.

(*g*) Do not point the weapon in any direction where an accidental discharge might do harm.

(*h*) After loading do not cock the pistol or the revolver until ready to fire.

(*i*) Keep the working parts properly lubricated.

To Load Pistol: Being at Raise Pistol (right hand grasping stock at the height of and 6 inches in front of the point of the right shoulder, forefinger alongside barrel, barrel to the rear and inclined forward about 30°).

Without deranging position of the hand, rotate the pistol so the sights move to the left, the barrel pointing to the right front and up.

With the thumb and forefinger of the *Left* hand (thumb to the right), grasp the slide and pull it toward the body until it stops and then release it. The pistol is thus loaded, and the hammer at full cock.

If the pistol is to be kept in the hand and not to be fired at once, engage the safety lock with the thumb of the *Right* hand.

If the pistol is to be carried in the holster, remove safety lock, if on, and lower the hammer *fully* down.

To Lower the Hammer: Being at the loading position at full cock.

1. Firmly seat thumb of *Right* hand on the hammer; insert forefinger inside trigger guard.
2. With *thumb* of *Left* hand exert a momentary pressure on the grip-safety to release hammer from sear.
3. At the same instant exert pressure on the trigger and carefully and slowly lower the hammer fully down.
4. Remove finger from trigger.
5. Insert pistol in holster.

Caution.—The pistol must *never* be placed in the holster until hammer is *fully down*.

Q. What are the requirements of the several grades of marksmanship?

A. The requirements for the qualification in the several grades of marksmanship are given in the following table:

TABLE OF CLASSIFICATION.

Grade.	*Rifle firing. Points.*
Expert rifleman	253
Sharpshooter	238
Marksman	202
First-class man	177
Second-class man	152
Unqualified[1]	...

[1] All who fail to qualify as second-class men or better, and those who for any reason did not fire the course and are not otherwise classified.

The soldier having attained the grade of marksman or better will retain that classification during his current enlistment unless in subsequent firing he attains a higher grade. The officer having attained the grade of marksman or better will retain that classification for a period of three years from

the date of qualification unless in subsequent firing he attains a higher grade.

The soldier who has completed the course of known-distance practice and is transferred thereafter, or who is discharged and reenlists, will not be given a second opportunity in the same target year to qualify.

A soldier who is discharged and reenlists within three months will retain his last qualification for one year from date of reenlistment unless in the meantime he shall have fired the record-practice qualification course. As soon as he fires the record-practice qualification course his previous classification ceases and he is classified according to the scores he may make in that course.

In case the soldier has not, at the time of transfer, completed his known-distance practice for that year, his company commander will complete his individual record sheet to date and attach it to the descriptive list which accompanies him, and the soldier will complete his known-distance firing with the organization to which transferred, unless in that organization known-distance practice for that year has been completed.

Q. What persons will be classified?

A. All who fire and who are borne on the rolls of the organization during any part of the practice season, or who are attached for practice by proper authority, will be classified.

Bandsmen who fire in the Philippines will not be classified.

For Coast Artillery, see special course A.

Q. What classifications are provided for special course A?

A. A special qualification is provided for all those who fire special course A, as follows:

Grade.	*Points.*
Marksman	150
First-class man	120
Second-class man	100
Unqualified	...

[1] All who fail to qualify as second-class men or better, and those who for any reason did not fire the course and are not otherwise classified.

Q. What insignia is provided for officers and enlisted men who qualify in the various grades of marksmanship?

A. To each officer and soldier qualifying for the first time as expert rifleman, sharpshooter, marksman, expert pistol shot and first-class pistol shot certain insignia, indicating their skill in marksmanship, will be issued. In case of loss or damage new issue may be made as provided for in paragraph 250.

Rifleman's Insignia; (*a*) Marksman's Pin.—To marksmen, when first qualifying as such, will be issued a marksman's pin. A soldier, having qualified as a marksman, may wear this pin as long as he continues to draw the increased pay for that qualification.

(*b*) Sharpshooter's Badge.—To the sharpshooter a silver badge will be issued. For the first qualification in this grade the badge will consist of a pin and cross; the soldier having once qualified as a sharpshooter may continue to wear the badge as long as he continues to draw the increased pay for that qualification. For each requalification as sharpshooter a silver bar will be issued, which will specify the year of requalification and will be attached to the badge between the pin and cross.

(*c*) Expert Rifleman's Badge.—To the expert rifleman will be issued a silver badge. The soldier having qualified as an expert rifleman may continue to wear the badge as long as he continues to draw the increased pay for that qualification.

For each requalification as expert rifleman a silver bar will be issued, which will specify the year of requalification and will be attached to the badge immediately below the pin.

Marksman's Pin, Special Course A.—To marksmen, when first qualifying as such in special course A, will be issued a special marksman's pin. If qualification is renewed in the succeeding season the pin may be worn another year, and so on for further seasons, but if the grade of marksman is not reached the pin will not be worn.

This pin will be issued upon the certificate of the company commander that the soldier has qualified under the regulations as a marksman in special course A.

Q. What action is taken when marksmanship insignia is lost or destroyed?

A. These insignia will become the property of the persons to whom issued. If they are lost by the owner or in transmission to him, or if they become unsightly from long wear, they may be replaced without cost to the owner. But in all cases the official certificate of the company commander to the effect that he has investigated the circumstances of the loss or damage and finds that no negligence can be imputed to the soldier will be required as evidence upon which to make the new issues. In case of loss, claim must be made within 60 days from date of loss. Duplicates, if desired for use on separate coats, will be sold to those entitled to wear the insignia.

Note.—The soldier's record of target firing is kept on blank forms especially prepared for the purpose. Copies of these with the instructions for their use are included in the form pocket in the back cover of this book.

Q. What targets are used in the known-distance firing?

A. Known-Distance Targets—

Target A.—The short-range target, used for 200 and 300 yards, is a rectangle 6 feet high, 4 feet wide. Black circular bull's-eye 8 inches in diameter, value of hit, 5; center ring, 26 inches in diameter, value of hit, 4; inner ring, 46 inches in diameter, value of hit, 3; outer, remainder of target, value of hit, 2.

Target B.—The mid-range target, used for 500 and 600 yards, is a square 6 feet on a side, black circular bull's-eye 20 inches in diameter; center ring, 37 inches in diameter; inner ring, 53 inches in diameter; outer, remainder of target. Value of hits, same as on target A.

Target C.—The long-range target, used for 800 and 1,000 yards. It is a rectangle 6 feet high and 10 feet wide. Black circular bull's-eye 36 inches in diameter; center ring, 54 inches in diameter; inner space outside of center ring bounded by vertical lines 2 feet from each end of target; outer, remainder of target. Value of hits, same as on target A.

Target D.—The rapid-fire target. A black silhouette representing a soldier in the prone position placed in the middle of a rectangular target 6 by 6 feet. Value of hits in the figure, 5; in the space (within parallels to figure, 4 inches in width above and at sides of figure, 14 inches below figure) immediately outside the figure, 4; in the space immediately outside the 4 space, 3; remainder of the target, 2.

Note by the Author.—This chapter on Small Arms Firing is not intended to be a complete treatise on the subject. It is designed to provide the Reserve Officer with sufficient material to pass his examination in the subject for his advancement in grade, and to provide the prospective Reserve Officer with sufficient material to pass his entrance examination.

It is believed that any man who has a thorough knowledge of the contents of this chapter will be able to pass his examinations in this subject without any difficulty.

Book Reviews

"The War of Positions." By Lieut. Col. Paul Azan, of the French Army, with a preface by Brig. Gen. J. E. Kuhn, U. S. A. Cambridge: Harvard University Press, 1917. Cloth, 186 pages. Price, $1.25.

The author of this book knows his subject not only theoretically but practically, and was sent by his government to the United States to aid in our military preparations for the war in which we are now engaged. This fact gives his statements an authoritative value and he has presented the fundamental principles of the matter in an exceptionally clear and able manner. The work discusses, among other matters, the rôle and functions of the different aims of the service, the organization of positions and trench duties; the offensive combat, its preparation, the attack, pursuit and the march of approach; the defense of a position, its organization, defense, retreat and the offensive return. There are no plates in illustration. A glossary attached is of value.

Sketching Methods. By Capt W. C. Sweeney, U. S. Infantry. San Francisco: Hicks-Judd Co., 1917. Flexible keretol, 16mo, 98 pages.

This little book presents the subject of military sketching in a rather different way than the conventional form. It contains many useful suggestions for the beginner, and seeks to simplify a subject which the author asserts has been wrapped in mystery and mathematics. For those who desire to become proficient in the practice of military sketching, the book contains many useful hints.

Elements of Trench Warfare. Bayonet Training. By Capt. Wm. H. Waldron. New York: E. N. Appleton, 1917. Cloth, 16mo, 225 pages. Price, 75 cents.

This book, like others by the same author, "fits the pocket," and contains in condensed form considerable information of use to the soldier in training for trench warfare. It is a guide for use in preliminary training only, as the War Department is expected shortly to issue the necessary orders and instructions for our Army.

Machine Gun Practice and Tactics. By Lieut. K. B. McKellar, Canadian Machine Gun Service. New York: The Macmillan Co., 1917. Cloth, 12mo, 165 pages. Price, 90 cents.

The author has been at the front during the past three years instructing men for active service in the present war. The method of organization of machine-gun units and the sequence of training set forth embody the result of this valuable experience. Among the topics which are taken up in full are: Objects and Outline of Training, Organization and Equipment of Machine-Gun Service, Characteristics of the Machine Gun, Visual Training and Judging Distance, the Indication and Recognition of Targets, the Theory of Machine-Gun Fire, Fire Direction, Combined Sights and Vertical Searching, Fire Orders and Signals, Night Firing, Overhead Fire, Indirect Fire, Range Cards, the Occupation of Various Positions by Machine Guns, Machine Guns in Open Warfare, Machine-Gun Trench Warfare, Machine-Gun

Field Works, the Organization and Duties in Trenches, Taking Over Trenches, and the Attack.

The text is illustrated with a number of specially-drawn diagrams and figures.

Vade Mecum. For use of officers and interpreters in the present campaign. By Eugene Plumon. New York: Brentano's, 1917. Flexible cloth, 4 x 6 inches, 164 pages. Price, 75 cents.

This is a very necessary condensed dictionary of French and English technical and military terms. It was specially prepared for the use of interpreters attached to the British forces and is the result of actual experience in such work. The expressions used are given in the order in which they will probably be needed, from the first landing of the troops to the end of the campaign. The ordinary French dictionary contains but few of the special terms used. The title, meaning "go with me," is very expressive of its usefulness, as one should never be without a copy. We commend it to all officers and enlisted men who expect to go to France.

Training for the Trenches. By Capt. Leslie Vickers, late Seaforth Highlanders. New York: George H. Doran Company, 1917. Cloth, 8vo, 127 pages. Price, $1.00.

This is a readable and instructive book, based upon personal experience during the first two years of the war in France. It is primarily intended for the use of those who are civilians in the process of becoming soldiers. It is not a treatise on war nor yet a scientific handbook, but is intended to bring home lessons that are sometimes too dearly bought.

It has brief chapters on: The Civilian and Soldier, Health, Disease, Vermin, Health and Officers, Cover and Trenches, Protection of Trenches, Artillery Fire, Gas and Liquid Fire, The Attack-Defense, The Attack-Offense, Equipment for the Field, Tricks for the Trenches.

THE UNITED STATES INFANTRY ASSOCIATION

"The object of the Association shall be to promote the efficiency of the Infantry arm of the military service of our country by maintaining its best standards and traditions, by fostering esprit de corps, by the dissemination of professional knowledge, and by exchange of ideas as to the utilization of such knowledge with particular reference to the rôle of Infantry in modern war."—Article III of the Constitution.

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CONDITIONS OF MEMBERSHIP

All commissioned officers in good standing, or former commissioned officers of honorable record of the regular or volunteer military or naval service including Reserve Corps, and of the National Guard are eligible for regular or associate membership in the Association. Membership dates from the first day of January or July nearest the date of enrollment.

Dues are $1.00 annually, payable in advance. Members may obtain the JOURNAL for $2.00 per year.

All communications should be addressed to the Secretary, the United States Infantry Association, Room 508, Union Trust Building, Washington, D. C. Cable address: Infantry, Washington.

On Changing Addresses

On the battlefields of Flanders the situation has developed into what has been aptly termed "a war of position," but in our Army we have not yet settled down to any one place, at least so far as the individual officers are concerned, and our members and subscribers seem to be constantly moving about. This makes it hard for us to keep track of individuals, and when it is considered that we have more than 10,000 names on our mailing list, it is self-evident that we need the help and active cooperation of each subscriber if his copy of the INFANTRY JOURNAL is to reach him regularly. We try to get each issue of the magazine in the mails on the first day of the month. If copies are not received in due time thereafter they must have gone astray in the mails. Write to us asking how your copy is addressed; the fault may be there. Please do not write and say you have notified us four times before to change the address as some have done. Possibly we did not receive the requests. It must be evident that it is far easier to make changes than to write letters explaining our failure to do so.

Let each member and subscriber cooperate with us by telling us just how to address the INFANTRY JOURNAL so that it will reach him. Use the form below for convenience.

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Amendments to Constitution

The following letter has been received:

WASHINGTON, D. C., July 12, 1917.

THE SECRETARY,
United States Infantry Association,
Washington, D. C.

Sir: The undersigned members of the Infantry Association propose the following changes in the Constitution of the Association: Article IV, Section 10, now reads: "Membership shall date from the nearest first of July or first of January to the date of election." This should be changed to read: "Membership shall date from the first of the month following the date of election."

The purpose of this change is to avoid the congestion incident to sending out a large number of bills and renewal notices at one time and to spread the work over the entire year.

Article X now requires a two-thirds vote to make changes or alterations in the Constitution. This should be changed to read "majority" vote, as it is practically impossible under existing conditions of expanding membership and foreign service to secure a vote from two-thirds of the members.

Respectfully,

F. R. BROWN	G. W. McIVER	J. B. BENNET
J. C. CASTNER	F. R. CURTIS	H. W. ARNOLD
D. T. MERRILL	CHARLES GERHARDT	W. P. BURNHAM
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P. C. HARRIS	W. KREUGER	C. CORDIER
J. E. WOODWARD	G. H. JAMERSON	C. H. HODGES
J. F. KERR	B. H. WELLS	F. W. BRABSON
T. O. MURPHY	F. S. COCHEU	TENNY ROSS
J. T. DEAN	O. J. CHARLES	L. D. GASSER
R. O. VAN HORN	W. H. BERTSCH	P. W. BROWN

The articles it is proposed to amend now read as follows, with the words proposed to be stricken out indicated in italics and the words to be inserted printed in black face type, viz:

Sec. 10. Membership shall date from the *nearest first of July or first of January to the date of election* **[first of the month following the date of election]**, and the annual dues thereafter shall become payable on that date in each succeeding year. Members over two years in arrears shall be dropped from the rolls.

Art. X. This Constitution may be amended or altered by a *two-thirds* **[majority]** vote of the regular members either in person or by proxies in writing.

Regimental adjutants are requested to attach the ballot herewith to a sheet of paper and, after obtaining the signatures and vote of all members of the Association present, forward it to the Secretary of the Association, Union Trust Building, Washington, D. C.

BALLOT

United States Infantry Association

On the proposed amendments to the Constitution, I vote as indicated opposite my name.

Infantry Journal Advertiser

GENTLE HINTS
No. 34

WASHINGTON, D. C.
OCTOBER 1, 1917

1. This is rather asking an opinion than a hint to advertisers.

2. Are we to be blamed for underestimating the demand for the INFANTRY JOURNAL when, with a mailing list of 7,500 names, we printed 10,000 copies of the September issue, only to find them all sold out by the 12th of the month?

3. We used to be able to guess within a hundred copies of the probable demand, and we're always worried when a subscriber failed to renew. Now the subscriptions come in by the hundreds and there is scarcely ever a failure to renew. If it does occur we attribute it to poor taste and try to forget the man's name.

4. Part of this demand for the INFANTRY JOURNAL is due to the aroused interest in military affairs, but we like to think that the larger part is due to the fact that we are making an interesting magazine.

5. Not the least of the interesting features, in our opinion, is the pages that follow. Here is the story of what the soldier needs for his comfort or convenience—and a few luxuries.

6. The cooperation of our advertising friends is a large factor in the making up of this magazine. Let us return the favor by cooperating with them when we wish to buy. It is the Infantry way! It is the only way!